

THE RELATIONSHIP BETWEEN FAMILY-MARITAL
FUNCTIONING AND CHRONIC ILLNESS

by

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To Dorothy and Howard Atkins

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Research has shown that stressful environmental conditions are often associated with subsequent alterations in human physiological functioning. More recently, interrelatedness between incidence of life change events (one form of environmental stress) and subsequent onset of illness has been demonstrated. The present study sought to determine relationships between the incidence of life change within discrete areas of living (i.e., family-marital, personal-environmental, and occupational-financial) and measures of subsequent chronic illness episodes (i.e., severity of illness and immediacy of onset). The focus of the study was upon family and marital factors in relation to illness; therefore, a measure of subjects' perceived marital adjustment was included.

It was predicted that a high incidence of life change within the family-marital area during two years prior to

illness would be directly related to the severity of the illness and inversely related to the immediacy of illness onset; likewise, that a reported level of marital adjustment among the chronically ill would be inversely related to illness severity and directly related to immediacy of onset. It was also predicted that both reported marital adjustment levels and incidence of family-marital life change would reflect more disruption within a chronically ill group in relation to a comparable group of healthy individuals.

Fifty-one chronically ill inpatients comprised the hospitalized group; 36 healthy participants formed the control group. The Schedule of Recent Experiences was used to assess the incidence of life change; the Locke-Wallace Short Marital Adjustment Test (SMAT), to measure subjects' perceived marital adjustment.

It was found that neither incidence of family-marital life change nor marital adjustment was related to severity of illness. However, family-marital life change was related to immediacy of illness onset. Also, a higher incidence of family-marital change as well as lower levels of reported marital adjustment were found among members of the hospitalized group than among members of the control group. The incidence of personal-environmental life change was found to be the most significant life change factor in the study, being related to both severity and immediacy of illness as well as occurring at a higher rate within the hospitalized

group than within the control group. Incidence of life change was found to decrease as a function of increased age among healthy participants, whereas no such trend toward life change stabilization was found among chronically ill subjects.

CHAPTER I

INTRODUCTION

The focus of medical research in recent years has increasingly centered upon the interplay between social-psychological factors and illness. A notable growth in the psychosomatic literature reflects increasing collaboration between physicians and behavioral scientists in developing a more comprehensive view of the illness process. A central concept in this expanded inquiry into illness phenomena has been that of *psychophysiological stress* within the context of ongoing life change events. In the present study, one particular source of psychophysiological stress has been selected for emphasis.

Reviews and discussion presented in Chapter I will focus upon the following research issues: (1) the relationship between stress and alterations in physiological functioning; (2) subsequent relationships between psychophysiological stress and illness; (3) the association between life crises and illness; (4) the delineation of life change, as one dimension of the life crisis concept, and its relationship to illness; and (5) relationships between life change events and specific aspects of illness. Following a review of the literature, the rationale for the present study, with

its focus on the association between family-marital life change and illness, will be presented. The specification of hypothesized outcomes related to these issues will conclude this chapter.

A Conceptualization of Stress

The relationship of stress to illness and physiological dysfunction has been a topic of interest to researchers for several decades. Much early research in this area originated in the laboratories of Harold G. Wolff at Cornell University and provided convincing arguments that "stressful" life events, by evoking psychophysiologic reactions, played an important causative role in the natural history of many diseases (Holmes & Rahe, 1967).

Unfortunately, as important as the concept of stress is to the behavioral sciences, it has successfully eluded precise definition. For example, Dodge and Martin (1970) listed intellectual stress, emotional stress, physiological stress, psychological stress, and social stress as comprising the nosology of stress. They also noted that the locus of stress may reside in some type of feeling or emotion internal in origin or in some external force or situation eliciting an apprehensive response from an individual.

For purposes of the present study, *stress* has been employed as a descriptive term which defines specific physiological reactions, as opposed to antecedent causes of these

reactions, a perspective consistent with usage within the medical and behavioral sciences. *Stress* is defined as "the state of apprehension and tension with associated physiological changes that accompanies the individual's attempt to adapt to any stimulus condition" (Dodge & Martin, 1970, p. 32). Having the virtue of succinctness, this conceptualization of stress also emphasizes the interrelationship between sociological, psychological, and physiological precipitants, all of which play a distinctive part in the stress process. This definition of stress is in general accord with studies to be revied and has been incorporated into the conceptual foundation of the present study.

Early Psychophysiological Studies

Most of the background research which sought to link stress to illness was conducted in the 1930s and 1940s and tended to be psychophysiological in nature; that is, the immediate effect of environmental events and psychological sequelae (emotional arousal) upon various physiological measurements constituted the methodology of choice. While physiological measurements varied according to medical syndromes of interest, the environmental events selected to elicit physiological alterations were of two types: (1) experimentally induced events conducted in controlled laboratory settings and (2) naturally occurring events arising spontaneously in a subject's environment. Representative studies from both categories will be reported here.

Controlled Laboratory Studies

As early as 1939, researchers were investigating an apparent relationship between stressful laboratory situations and physiological alterations or disease. Mittelmann and Wolff (1939), for example, studied the relationship between stressful affective states and skin temperature changes, and found that drops in skin temperature during stressful periods occurred in most subjects. These temperature drops were attributed to an interplay between emotional stress and environmental temperature.

Several years later, these experimenters (Mittelman & Wolff, 1942) extended their efforts to patients with peptic ulcers and sought to ascertain changes in gastroduodenal function that might be associated with various emotional situations. During stressful interview situations, gastric secretion and stomach motility increased in all subjects, with peptic ulcer patients experiencing an intensification of symptoms. In subsequent supportive interviews, all subjects experienced a decrease in secretions and motility. Observed alterations in gastroduodenal functioning were attributed to the presence or absence of emotion-arousing situations and were considered likely forerunners of tissue deterioration.

A third experiment (Mittelmann & Wolff, 1943) invaded the sanctity of psychoanalytic interviews in order to explore the relationship between a flow of psychological events

observed during interview and the concomitant bodily states of five patients. Skin temperature changes were monitored in five analyses during some 83 interviews, and various emotional states in the patients were simultaneously noted. A consistent relationship between finger temperature and a large variety of emotional reactions was reported.

Grace and Graham (1952) undertook to document an interplay between specific sets of attitudes and 12 physiological symptoms or diseases, e.g., urticaria, cold hands. On the basis of interview information obtained from subjects, the following conclusion was offered:

It was found that each of these conditions was associated with a particular, completely conscious attitude toward the precipitating situation. There were, in other words, physiological changes specific to each attitude.

(Grace & Graham, 1952, p. 250)

This landmark work provided the impetus for a research movement based on the "specificity of attitude" hypothesis.

Stern, Winokur, Graham, and Graham (1961), for example, made a further inquiry into attitude specificity. Healthy subjects were told under hypnosis to assume one or another of three attitudes which had been found in previous studies to be associated with hives, Raynaud's disease, and essential hypertension. Three of five predicted physiological measurement differences were found significant. Different attitudes were found to produce different but predictable physiological changes which parallel in healthy subjects

the pathological symptoms of subjects with the above three medical conditions.

In another study of attitude specificity, Graham, Stern, and Winokur (1958) recruited subjects to participate in hypnotic sessions during which two different attitudes were suggested, i.e., attitudes associated with Raynaud's disease and with hives. A simultaneous measurement of skin temperature response was made. The experimental attitudes, when suggested under hypnosis, were found to produce the predicted skin temperature responses.

More precisely designed experiments were undertaken by Ax (1953) and Schachter (1957). Both researchers exposed subjects to apparently accidental situations intended to arouse fear or anger. The fear-arousing situation resulted from an apparent breakdown of the laboratory apparatus that threatened harm to the subject; the anger-inducing situation was created by insolent behavior on the part of a collaborator posing as a laboratory technician. There were, on the whole, differences in physiologic responses to these two situations.

Natural Environment Studies

Another series of studies regarding physiological alterations in response to stress focused on stressful situations found to occur in the natural environment. Studies using experimental manipulations of "real life" situations

have been few, undoubtedly because of inherent difficulties in design. Essentially, such experiments have exposed the subject to disturbing events as they actually occurred rather than to abstractions of such events via hypnotic suggestion, interview, etc.

Holmes, Goodell, Wolf, and Wolff (1950) attempted to document the effect on nasal functioning of unpleasant affect stemming from stressful life events. Much of the data emanated from subjective reports of life experiences and a subsequent interference by the experimenters. The data concerned the affective reaction that accompanied such experiences. Nasal dysfunction was represented as an attempt by the body to shut out noxious stimuli which, in this research, consisted primarily of unpleasant emotional states arising from difficult life experiences.

Engel, Reichsman, and Segal (1956) conducted investigations of gastric activity in the presence of different environmental conditions. In observations of a baby girl with a gastric fistula, it was found that marked changes in gastric activity could be induced either by changing the person interacting with the girl or by changing the interactive behavior. For example, when the girl was with a familiar observer toward whom she showed obvious signs of affection, her stomach secreted substantially more acid than when she was in the presence of a stranger. Also, Wertlake, Wilcox, Haley, and Peterson (1958) found that the

serum cholesterol level in medical students was higher on examination days than on nonexamination days.

Wolff (1963) conducted a more in-depth study of life situations, personality features, and the migraine syndrome. A thorough compilation of life histories encompassing a number of important developmental and personality variables was conducted. Wolff concluded that stressful situations in and of themselves did not necessarily evoke physiological malfunctions. Instead, he contended, the psychological makeup of the individual must be conducive to stress induction occurring in the context of difficult life situations.

Personality Versus Environmental Approaches

Two directions have been taken in research reported in the literature. The first direction has been oriented toward the role of personality structures in relation to illness susceptibility; the other, toward the contribution of environmental events to the onset of illness. In essence, a choice has been offered between internal, largely intrapsychic personality variables and external, environmental events when approaching the study of stress and its relationship to illness. In the present investigation, the latter course of inquiry was selected as offering the most promise for identifying clear-cut, quantifiable stress factors that may be associated with illness.

Previous research efforts toward relating different aspects of psychological stress to changes in health have

been at best equivocal. Many of the studies reported above (e.g., Mittelmann & Wolff, 1939, 1942, 1943; Grace & Graham, 1952; Stern et al., 1961) were based upon extensive case-by-case detailing of subjects' developmental histories and psychological makeups. Apparently, the psychological variables related to stress are difficult to identify and quantify. Indeed, all these studies are somewhat deficient insofar as methodology is concerned. To wit, many of these studies were based on anecdotal data or on case histories, and with the exception of the study by Stern et al. (1961), statistical analyses of the data are either nonexistent or markedly inadequate.

The anecdotal approach to data collection in these studies may well reflect the methodological *zeitgeist* of the times, but this approach also reflects the difficulties to be encountered in developing a valid, comprehensive formulation concerning the psychological status of illness-prone individuals. For example, Holmes et al. (1950) presented extensive case histories and psychological status reports in an attempt to link affective reactions and personality types to nasal disorders. In this myriad of documentation, some similarities in background and psychological makeup did appear to exist among persons experiencing disturbances in nasal functioning, but another, more important, conclusion is inescapable: Among individuals experiencing nasal symptomatology, each maintains a unique background of

deprivation, frustration, dissatisfaction, etc. Inasmuch as each individual's psychophysiological system is unique in many ways, the stress potential of a given affective state may be understood only within the context of this system. Hence, one individual's experience of anger and resentment may culminate in acute hyperemia and hypersecretion in the nasal passageways whereas a similar emotional response of the same intensity in another individual may result in no symptom formation.*

In short, the process whereby personality characteristics interface with physical illness must seemingly be investigated within the framework of each individual's psychophysiological system; however, this approach tends to discourage the collection of data sufficient for definitive statistical analyses to be conducted. Therefore, due to the burdensome sampling procedures and the relative inaccessibility of intrinsic psychological states and processes, the personality approach to stress as related to illness was discarded in favor of an approach which focuses upon environmental events.

Life Crises Related to Specific Disease Entities

While the foregoing discussion has highlighted psychological research into stress and illness, a series of studies

*It is noteworthy that Thomas Holmes has abandoned his personality orientation to illness and is currently a leading investigator of environmental factors related to illness.

having a somewhat different focus has emerged in the past 25 years. These studies have sought to relate the concept of *life crises*, i.e., stress-inducing situations that persist over time, to specific types of disease. These studies differ from the previously cited research in that they have drawn heavily from psychosocial life histories and historical medical data.

The major portion of life crisis research began around 1950. During this time, Hans Selye advanced a well documented theoretical link between stress and subsequent deterioration of body tissues, organs, and systems.

The General Adaptation Syndrome

Selye and associates (Selye, 1956; Selye & Fortier, 1949) advanced the General Adaptation Syndrome (GAS) in an effort to provide a physiological account of the body's attempts to cope with a stressful condition or event. As detailed by Selye and Fortier (1949), the GAS was seen as a three-stage model of biological mobilization consisting of an alarm reaction stage, a stage of resistance, and a stage of exhaustion. Selye maintained that this process centered around activity of the pituitary-adrenal system which produces important alterations in the morphology and function of the nervous system.

The pituitary-adrenal system was portrayed by Selye as the main endocrine regulator of adaptive processes,

functioning as the mobilizer of bodily resources meeting the threat of a stressor agent. He contended that if the process of adaptation continued unabated, significant tissue damage would ensue, in some cases leading to death. Selye's early research focused primarily upon the effect of physical trauma, e.g., anoxia, hemorrhage, burns, upon the organism; however, he later advocated as well the potency of alarming psychogenic stimuli, including "a game of tennis or even a passionate kiss" (Selye, 1956, p. 53).

The advent of Selye's general adaptation theory appears to have given credibility as well as impetus to a psychosomatic movement blossoming in the early 1950s. Researchers were no longer cast in the role of speculators regarding stress and its contribution to disease; therefore they were able to inquire into sources of stress more diligently, without the necessity of couching conclusions as tentatively as their predecessors. The following studies are representative of the research into relationships between life crises and illness.

Life Crisis Studies

Research in life crisis and illness has varied with respect to organ systems and areas of psychosocial functioning involved. For example, Holmes, Treuting, and Wolff (1951) explored the relationship between life situations, emotions, and nasal disease, finding that a life situation

engendering conflict and anxiety enhanced the magnitude and intensity of ongoing nasal hyperfunction and heightened individual susceptibility to further nasal inflammation.

In a study of hospitalized male leukemia patients, Greene (1954) found that, in all cases, both symptoms and diagnosis of the disease occurred while the patient was having to adjust to stressful life situations. Such stress, according to Greene, was related primarily to loss or separation from significant persons in the patients' lives.

In a similar study of female leukemia patients, Greene, Young, and Swisher (1956) found that all patients under study had experienced some type of loss, separation, or threat of separation during four years prior to the onset of disease. "One of the multiple conditions determining development of lymphoma and leukemia in adults may be separation from a key object or goal with ensuing depression" (Greene et al., 1956, p. 303).

Weiss, Dlin, Rollin, Fischer, and Bepler (1957) compared patients with coronary occlusion to a matched control group and found that nearly half of the coronary patients experienced gradually mounting emotional stress over a period of months or years prior to onset of the occlusion. No evidence of stress buildup was observed in the control group.

Hawkins, Davies, and Holmes (1957) found that a group of sanatorium employees who became ill with tuberculosis had experienced "a concentration of disturbances, such as domestic

strife, residential and occupational changes, and personal crises" during two years preceding the onset of disease. These findings contrasted significantly with a control group of healthy employees. Thus, stress-inducing environmental conditions were conducive to lowered resistance rendering the individual more susceptible to tubercular infection.

Greene and Miller (1958) investigated the relationship between various types of loss, separation, or threats of separation and onset of leukemia in children and adolescents. Losses included the birth of a younger sibling, changes of school or residence, and the death, separation, or the threat thereof, of parents and grandparents. One or more of these types of losses occurred in 94% of these young patients, with half of the losses occurring during a six-month period prior to onset of the disease.

A study of coronary heart disease by Russek and Zohman (1958) compared coronary patients and a corresponding control group to determine etiological factors that contributed to the disease. In addition to hereditary and dietary factors it was found that "severe emotional strain," of occupational origin, was present in 91% of the coronary patients, compared with a 20% rate of incidence among control group members.

Another study of coronary dysfunction (Fischer, Dlin, Winters, Hagner, and Weiss, 1962) revealed that gradually

mounting tension, acute emotional stress, and "conscious stress" were present to a significant degree in coronary occlusion. Three years prior to the onset of occlusion, an unusually large number of stressful environmental events were reported by most patients.

Jacobs, Spilken, and Norman (1969) conducted a study of upper respiratory infection in college students. The infected group and a healthy control group were given a series of questionnaires to determine, among other things, the incidence rate of distressing life changes during the year prior to infection. The infected group had experienced a significantly larger number of personal crises or failures during the year prior to illness than had the control group. A further analysis revealed that 63% of crisis events reported by the infected group occurred during a two-month interval prior to the onset of illness.

A recent and important study by Dohrenwend (1973) of stressful life events sought to determine the effect of the desirability of a given event upon the "stressfulness" of that event. A psychological symptom checklist as well as a measure of life change events experienced during the previous year were administered to a cross-section of respondents. Life change responses were scored in two ways. First, events were assigned dichotomous weights according to relative desirability or undesirability. The other scoring procedure consisted of attaching a magnitude of readjustment

value derived by Holmes and Rahe (1967) to each event. Both measures of life change were correlated with psychological symptom formation reported by subjects. The results revealed that while both measures of life change were significantly related to the occurrence of symptoms, readjustment values were more highly correlated with symptom formation than were desirability weights. "Change, rather than undesirability, is the characteristic of life events that should be measured for the more accurate assessment of their stressfulness" (Dohrenwend, 1973, p. 174).

Life Change Related to General Incidence of Stress

Retrospective Studies of Life Change and Illness Onset

As demonstrated above, a considerable amount of research has been undertaken to demonstrate the relationship between life events and onset of specific diseases. However, more recent studies have shown that life change is related to a wide variety of illnesses and other physiological dysfunctions. For example, Hinkle, Christenson, Kane, Ostfeld, Thetford, and Wolff (1958) reported that, in general, persons who find their life situations least satisfactory and most demanding have the highest incidence of illness. A group of 20 persons of Chinese origin were studied, 10 having had a high illness rate throughout their lifetimes and 10, a low rate. Without knowing the illness rates, a

psychiatrist was able to distinguish members of each group significantly better than chance on the basis of whether they saw childhood environment as satisfactory (the low illness group) or unsatisfactory (the high illness group). Individual illnesses were not distributed at random during the lifetime of subjects, but often occurred in clusters. These clusters of illness emerged during times when subjects reported difficulty in adapting to stressful life situations.

Rahe, Meyer, Smith, Kjaer, and Holmes (1964) sought to demonstrate that many, if not all, diseases have their onset during such clusters of social stress. Seven patient samples, five of whom manifested distinct medical syndromes, and two control groups were studied. The five medical entities included tuberculosis, cardiac disorders, hernia, skin disease, and pregnancy. The instrument used to gather information concerning each individual's history of life change was the Schedule of Recent Experiences (SRE), devised by Hawkins et al. (1957). The SRE is composed of 42 life events "empirically derived" from the authors' clinical experiences and represents a broad spectrum of subjects' recent life changes. Representative events were drawn from the areas of family constellation, marriage, occupation, financial status, residence, group and peer relationships, education, religion, and recreation. All items are equally weighted with regard to the degree of associated stress. In a separate section, major social readjustments are listed

according to year of occurrence over a 10-year period.

From a sample of tuberculosis sanatorium employees who developed tuberculosis on the job, SRE data were compared to an individually matched control sample of healthy employees. "The temporal pattern of social stresses experienced in the ten-year period prior to illness was the differentiating feature between the two groups. The tuberculosis group showed a skewing of social stresses into the final two of the ten premorbid years" (Rahe et al., 1964, p. 42). The difference between the tuberculous group and the control group with regard to amount of reported social stress was significant beyond the .02 level. Similarly, life change data from a sample of tuberculous outpatients and a group of cardiac patients were compared to a control group of similar, but healthy subjects and to one another. Both disease groups demonstrated clustering of social stresses in the final two years prior to onset of disease. The life change differences between either patient sample or the respective control groups were significant beyond the .05 level.

Skin disease patients reported that between 25% and 67% of all changes in social status experienced in the 10 years prior to illness onset were encountered in the final 2½ years. Data from patients with inguinal hernia indicated that if these subjects were to experience changes of a personal nature in the 10 years preceding onset of symptoms,

the probability was two to four times as great that onset would occur in the final two-year period than at any other time. Unwed mothers also experienced a steady rise in frequency of social stress up to the year of delivery. The clustering of changes in social status as measured by the SRE during the final two premorbid years was termed the "psychosocial life crisis." No uniform method of presenting data was undertaken, however, and no statistical procedures were conducted with the skin disease, hernia, and pregnancy groups.

Holmes and Rahe (1967) developed a rating scale whereby not only the number and types of stressful life events could be measured but also the magnitude of required readjustment, i.e., the subjective impact, that each of these events carried for the individual. This scale was developed to introduce greater precision into the quantitative study of the relationship between life change and physical illness. The sample was composed of 394 subjects, each of whom completed a pencil-and-paper form of the Social Readjustment Rating Questionnaire. The questionnaire included the 42 life events listed on the SRE and an additional item. Each subject was asked to rate these life events according to relative degree of readjustment necessary.

To provide a reference point on the questionnaire, the life event of "marriage" was assigned an arbitrary value of 500, and each subject was asked to rate other events in

terms of required readjustment according to the degree of departure from that anchor value. Results were converted to a ratio scale in which each of the 43 mean scores were reduced by a factor of .10. This procedure produced a scale ranging from a mean value of 11 for a minor violation of the law to a mean value of 100 for the death of a spouse. All remaining studies reported here employed the life change magnitudes in conjunction with the SRE.

Rahe and Holmes (1966a) conducted a pilot study of the relationship between life crisis events and onset of illness. Eighty-eight resident physicians completed the SRE and a questionnaire asking for a list of all major health changes by year of occurrence for the previous 10 years. Resident physicians were chosen as subjects because of presume sophistication in matters of health and disease. The items subscribed to in the SRE were summed for each year, and total life change units (LCU) were derived and plotted for each subject for the decade under study.

A total of 88 diseases or changes in health status were reported by 96 subjects for a 10-year period prior to the study. Of the 96 subjects, 89 (93%) reported that health changes occurred within a two-year period following the occurrence of a life change cluster which totaled at least 150 LCU per subject/year. The term *life crisis* was defined as "any clustering of life change events whose individual values summed to 150 LCU or more in one year." Chi square was

employed to test the significance of the 93% association between reported health changes and life change events, and the association was found to be significant beyond the .001 level.

A linear relationship was claimed between the magnitude of life crisis and the risk of health change. Three ranges of scores were used to delineate mild (150-199 LCU), moderate (200-299 LCU), and major (300+ LCU) life crises. For subjects with a mild life crisis, 37% had an associated health change. For those within the moderate range, 51% reported an associated health change, with a 79% health change occurrence rate found among those in the major life crisis category.

The statistical analysis of data reported by Rahe and Holmes is at best disappointing. A chi-square procedure for frequency data was limited to defining the probability of events occurring beyond expected (chance) occurrence. No stronger measure of the magnitude of association between reported life change events and subsequent changes in health was attempted.

A study by Thurlow (1971) of 165 employees in an Ontario brewery sought to demonstrate that an individual's illness experience is related to life situation. A number of tests and questionnaires, including the SRE, were administered to each individual in the sample, with illness data obtained from company health service records. Information

was compiled for each of five years preceding data collection. A two-year followup was also conducted in which 111 of the original sample participated.

From the original 42 items of the SRE, 38 were selected for use in the study. Of these 38 items, 20 were judged to be objective, i.e., were externally verifiable (e.g., change in residence), while 17 were placed in a subjective category, i.e., were judged by the subject to have occurred (e.g., change of eating habits). An item concerning major health change was scored in a separate category. A total score derived from the sum of the objective and subjective categories was also compiled. Six illness parameters for the five-year observation period were intercorrelated, with "number of illnesses" and "total days off" being selected to represent relatively minor and relatively major illness experiences, respectively.

In computing the correlation between SRE score categories and the two illness parameters described above, Thurlow found that the objective category of SRE scores was not significantly correlated with either retrospective (preceding five years) or prospective (following two years) illness ratings. The strongest relationship existed between five-year total SRE subjective scores and number of illnesses retrospectively and days off prospectively.

Thurlow then introduced a regression analysis, in both retrospective and prospective directions, employing

the two illness parameters as dependent variables and a multitude of questionnaire data (including the various components of the SRE) as independent variables. In the prospective regression analysis, neither of the SRE category scores accounted for a significant amount of illness variance. However, in the retrospective analysis, the subjective category of the SRE was found to be a significant predictor of both illness parameters. On the basis of these findings, Thurlow concluded:

Correlations of these [two] illness parameters with the questionnaire data suggested that the subjects' social experience, as measured by the SRE, was associated with relatively minor illness of preceding years and with relatively major illness of subsequent years. Minor illness would thus seem to be related to ongoing social change, which may in turn affect future health in terms of more serious illness (reflected in "number of days off"). . . . Furthermore, the subjective impression of social change for the preceding five-year period was more highly related to subsequent illness than the impression of social change for the preceding year. This suggests that the "overall viewpoint" of the rater when he completed the questionnaire is a more useful predictor of illness than is a year-by-year analysis of the changes experienced by him. This interpretation is at variance with previously cited experience in the use of the SRE questionnaire.

(Thurlow, 1971, pp. 84-85)

While Thurlow's conclusions may be of some heuristic value, the validity and comprehensiveness of the illness parameters used must be questioned. While minor and major illnesses may be related statistically to "number of illnesses" and "number of days off," respectively, this definition of illness

appears to be more in the interest of convenience in gathering data than of accurate portrayal of subjects' true health profiles.

Rahe, McKean, and Arthur (1967) conducted a retrospective examination of 50 health records of Navy and Marine Corps personnel who had received a discharge from the service for health reasons. Mean yearly illness episodes were calculated for each of the 50 subjects, and cluster years of illness were defined in accordance with procedures established by Hinkle and associates (Hinkle et al., 1958; Hinkle, Redmont, Plummer, and Wolff, 1960). A slightly modified form of the SRE, the Life Change Units Scale, was developed to fit life change characteristics of the sample. The Life Change Units Scale contains 41 different categories of life change, ranging from 11 LCU for a minor infraction of the law to 100 LCU for the death of a spouse.

The health record of each subject was inspected for information about significant life changes which could be fitted into one of the 41 life change categories. An important exception to this procedure was the exemption of all life changes that appeared to be symptomatic of illness or a result of illness; thus a spurious elevation of the correlation between life change and illness was circumvented.

Three separate mean LCU totals were computed for subjects under study: (1) the mean LCU value per year of active duty for the entire sample; (2) the mean LCU total for the

year prior to a single illness episode or clustering of illness episodes of a minor nature; and (3) the mean LCU total for the year prior to a single illness or clustering of illness episodes of greatest severity. Interestingly enough, the mean LCU total for the year prior to both a minor and major health change differed from the mean LCU value per year beyond the .001 level of significance. This finding is to be contrasted with Thurlow's (1971) conclusion that no significant relationship between life change and major illness episodes existed. Indeed, Rahe et al. (1967) found that the mean LCU total for the year prior to a major illness was significantly greater than for the year prior to a minor illness. However, an undisclosed proportion of illness episodes reported in this study were psychiatric in nature. Objections to including this diagnostic category will be discussed in a later section.

A recurring issue within the field of psychosomatic research centers around the relationship between the illness experience and various life events seen to occur shortly before and/or after the experience. A number of theoreticians (e.g., Wolff, 1963; Weiss & English, 1957; Graham & Stevenson, 1963) have debated whether life changes occurring around the time of an illness operate as cause or effect of that illness. Research by Rahe and Arthur (1968) addressed itself to this issue with some interesting results. A sample of 2,900 naval officers and enlisted men completed the SRE and

a health questionnaire spanning the previous four years. LCU and illness data were examined at six-month intervals for the four-year period; each six-month interval in which an illness experience was indicated was designated as an illness period. Similarly, six-month periods free of health change prior to or following an illness episode were designated as pre- and postillness intervals.

As in other studies (Rahe et al., 1964, 1967; Hinkle et al., 1958; Rahe & Holmes, 1966a), the magnitude of life change was observed to increase significantly over six-month intervals until the time of illness onset. Further analysis, however, revealed a reversed trend of life change subsequent to an illness episode, producing a nearly symmetrical picture of life change surrounding the illness period. "Life changes resulting from illness experience are virtually equal in timing and intensity to those life changes having a causal influence on illness" (Rahe & Arthur, 1968, p. 344).

Prospective Studies of Life Change and Illness Onset

Several studies have been conducted in which life change data have been used to predict subsequent changes in health. One such prospective study of life change and illness onset was conducted by Rahe and Holmes (1966b). The same resident physicians who had served in a previous study (Rahe & Holmes, 1966a) were contacted for an update on their health status during an eight-month interval following the

original study. A response was received from 84 residents, and the new data were analyzed for associations with the previously gathered life change data.

Thirty-two major health changes were reported during the follow-up period; 31 of these changes followed a life crisis of at least 150 LCU (97%). Subjects were divided into high, moderate, or low risk groups based on the original LCU scores, approximating the mild, moderate, and major life crisis groups of the original study.

With the subjects at risk for eight months in the present study, 49% of subjects with a major life crisis experienced health changes. For those subjects with a moderate and a mild life crisis, 25% and 9%, respectively, experienced health changes.

(Rahe & Holmes, 1966b, p. 3)

When data from the two studies by Rahe and Holmes (1966a, 1966b) were plotted, the slope of the two lines was similar. Differences in health change percentages among major, moderate, mile life crisis categories in the prospective study were statistically significant beyond the .01 level.

Rahe (1968) conducted another prospective study in which he employed life change data obtained from nearly 2,500 enlisted men and officers aboard three U. S. Navy cruisers, to predict that population's future illness rates of minor and major illness. The SRE was administered to each individual in the sample, with LCU totals being compiled for six months preceding the study. At the end of a six-month cruise period, each man's medical record was reviewed

for illness entries. Subjects were rank-ordered according to each man's LCU total for only the six-month interval immediately prior to the cruise. The upper 30% of this group was designated as a high risk group, whereas the lower 30% was designated as a low risk group. Rahe found that the high risk group reported a significantly greater number of illnesses than the low risk group for each of the six months studied. Differences were significant beyond the .01 level during the third month and beyond .001 for the remaining five months.

One difficulty with the shipboard studies conducted by Rahe and his associates lies in the possibility that some crew members did not report illnesses. Rahe (1972) contended that this is a particularly valid question for older, senior enlisted men who could retire to quarters with an illness without having to report it. A study by Cline and Chosey (1972) of 134 military academy cadets dealt effectively with the problem of illness reporting. A prospective study of life change and future illness was conducted with a sample required to report for illness histories and physical examinations two weeks following the beginning of training at the academy.

A correlation of .22 was found between previous six-month LCU scores and number of illnesses experienced during the first two weeks of training, a correlation significant at the .05 level. For approximately half the subjects,

health change data were collected at four-month intervals during the following year. Correlations obtained between these subjects' LCU scores and total number of health changes were .34 at four months (significant at .01), .30 at eight months (.05), and .37 for the entire year, excluding the initial two weeks (significant beyond .01).

Concurrent Research into Life Change and Illness Onset

An interesting study by Holmes and Holmes (1970) examined the concurrence of daily life changes with corresponding daily health changes. A Schedule of Daily Experiences (SDE) was derived from the SRE in order that the 42 life change items might be recorded on a daily basis. At the bottom of the schedule, each subject was instructed to record all day-to-day health changes however minor. The sample consisted of 55 students and staff at the University of Washington Medical School, with subjects' participation in recording daily events ranging from two to nine weeks. The amount of time during which subjects recorded life and health changes totaled more than 1,300 man-days. During this period, over 1,200 health changes were reported, only one of which required professional attention (broken tooth). These health changes were described as the "signs and symptoms of everyday life, which reflect in varying degrees each individual's life style" (Holmes & Holmes, 1970, p. 122).

Statistical analysis of the data revealed a significant relationship (.001) between the magnitude of daily life

change and subsequent health changes. A significant clustering effect was found for high LCU totals on the day before, day of, and day after the occurrence of a symptom. A similar clustering of low amounts of life change was found surrounding days for which no symptoms were reported.

Life Change and Severity/Immediacy of Illness

Life Change and Illness Severity

A positive relationship between the occurrence of life change and the onset of illness has been documented in the foregoing discussion. Several other studies have demonstrated that the magnitude of life change events is also related to the severity of subsequent illness episodes. For example, Rahe et al. (1967) sought to determine whether life change history was related to illness severity. On the basis of life change histories and medical records of 200 medically retired servicemen, it was found that "severe illnesses and clusterings of severe illnesses were preceded by LCU totals significantly higher than those totals preceding minor illnesses" and was concluded that "it appears that death, rather than coming on unpredictably in life, may well follow a major life crisis" (Rahe et al., 1967, p. 365).

Wyler, Masuda, and Holmes (1971) conducted an investigation which explored the relationship between severity of illness and quantity of life change that patients had undergone during two premorbid years. The sample consisted of

232 hospitalized patients manifesting 42 different disease entities. Life change information was obtained by administering the SRE to each patient. Subjects were asked to indicate which changes had occurred during time periods of six months, one year, and two years prior to hospitalization. LCU totals were computed for each subject for these three time periods. The measure of illness severity for each disease was obtained by assigning the illness severity ratings derived by Wyler, Masuda, and Holmes (1968). The procedure for assessing illness severity will be described in more detail in Chapter II.

Several findings are of interest here. To begin with, a significant positive relationship between life change and illness severity was found. For the time periods of six months, one year, and two years prior to illness onset, the correlations between these two variables were .30, .32, and .35, respectively, each significant beyond .005. When the diseases were divided into acute and chronic categories, only the latter showed a significant positive correlation (.65) in all time periods. Acute illnesses correlated negatively but nonsignificantly in each time period. Black members of the sample tended to report larger LCU totals than white members while simultaneously exhibiting illnesses of less severity. With the removal of this minority group, correlations between life change and illness severity were elevated to .38, .41, and .48 for the six-month, one-year,

and two-year periods, respectively. Regarding this apparent bias,

it may well hold true that the more homogenous the sample becomes, with respect to socio-economic class, the stronger the relationship between seriousness of illness and quantity of life change. . . . It is possible that different ethnic and/or socio-economic groups have different basal levels of life change.

(Wyler et al., 1971, p. 119)

These findings that acute illness severity was not related to magnitude of life change and that minority group LCU totals were consistently higher than totals for whites had important implications for the sampling procedure of the present study; they will be discussed in greater detail in Chapter II.

Life Change and Immediacy of Illness

The notion that people who experience a large amount of stressful life change over a short period of time succumb to illness more rapidly is an interesting, yet largely untested proposition. Rahe (1968), studying Navy cruiser personnel, found that individuals in the highest two LCU deciles (based on prospective SRE administration) developed nearly twice as many first illnesses during the first follow-up month as individuals in the two lowest LCU deciles. During the second follow-up month, 60% more first illnesses were reported by the same high LCU group than by the low group. Preliminary results reported by Rahe suggested that an

immediacy of illness concept would serve as a useful measure of the illness response to stressful life change.

Effect of Changes in Family Life Patterns on Illness

The usefulness of the SRE as a measure of life change has been amply demonstrated, at least insofar as applications to illness incidence are concerned. However, virtually no attention has been given to relationships between various life change areas and illness. For example, while marital and family variables were apparently regarded by developers of the SRE and related life change measures as quite important, almost no research has been undertaken to determine the relative contribution of family-related stress to illness. The SRE includes 15 familial or marital life change events out of a total of 42 events. The magnitude of the LCU ratings which accompany these items subsumes 47% of the total possible LCU score. With such important consequences for health being attributed to the vicissitudes of family and marital functioning, the dearth of research in this area is surprising.

One study undertaken in this area (Sheldon & Hooper, 1969) was far from definitive. An intensive study of 26 couples during the first year of marriage was conducted by collecting marital adjustment and health status information. The sample generally scored in the well-adjusted range of marriage, with only two couples falling in a "poorly adjusted"

category. A comparison of the six most highly adjusted with the six least adjusted couples revealed that health measures for both sexes differed significantly (.05) between the two groups, with poorly adjusted marriages exhibiting a larger incidence of poor health. Use of the Cornell Medical Index (a relatively subjective illness measure), coupled with the fact that the sample was small, drawn from a university population, and married for one year or less, tended to narrow the conclusiveness of the study. Yet a relationship between marital functioning and illness has been demonstrated, supporting further exploration in the present study.

The Present Investigation

The preceding review of the literature has presented the evolution of research from the early studies of stress-inducing stimuli and altered physiological functioning. Two key concepts in these studies, i.e., stress-inducing stimuli and physiological alteration, have been preserved in subsequent expansion and elaboration of research in this area to the point that life change events have been found to be related to illness onset. The present study was conceived with the intent of exploring associations between various areas of life change and illness with a focus upon family-marital functioning.

The selection of family-marital functioning as the primary area of emphasis was based upon two considerations,

both empirical in nature. The first of these considerations was the observed preponderance of familial and marital life change events on the SRE (see above). The second consideration arose from the author's experiences with both medical and psychiatric patients at the Veterans Administration Hospital at Gainesville, Florida. In this regard it was observed that patients with multiple hospitalizations often reported disruptive or unsatisfactory family-marital conditions at home. These observations engendered a curiosity if a relationship could be found between the status of family-marital environments and subsequent illness episodes requiring hospitalization. This curiosity was subsequently incorporated into a research paradigm founded upon the assumption that family-marital variables are in fact related to illness.

The design of the present study constituted an extension and modification of previously cited research methodology. The concept of life change was selected as the primary vehicle of assessing stress-inducing stimuli because of its demonstrated efficacy as a measurement technique. Insofar as family-marital functioning was concerned, two variables were chosen: (1) life change rates within the familial and marital areas of the SRE and (2) marital adjustment. The rationale for use of the family-marital areas of the SRE has been discussed above. However, a second measure of family-marital functioning was desired in order to provide

a more encompassing view of this area. While results of the study by Sheldon and Hooper (1969) were limited in conclusiveness, the observation that marital adjustment is related to health status prompted the inclusion of this measure in the present study.

Two measures of physiological alteration in the present study were derived from the life change/illness literature. The first of these, severity of illness, was seen as an important aspect of the illness process. As noted above, the viability of this variable was demonstrated by Wyler et al. (1971), and the measurement process was clearly spelled out in an earlier study by the same group (Wyler et al., 1968). The other measure of physiological alteration, immediacy of illness, has not been previously studied. Based on findings by Rahe (1968), however, it was felt that this concept merited further exploration; hence immediacy was selected as the second illness variable. With regard to acute illness, the notable lack of significant findings reported by Wyler et al. (1971) suggested that few, if any, productive findings would emanate from the inclusion of this illness category in the study. Hence, hospitalized patients were limited to those experiencing chronic illness.

One notable omission in the previous research has been the use of control groups, a mainstay in the behavioral sciences for many years. If properly employed, the use of control groups lends considerable strength to conclusions

about experimental group results. Most of the previously cited studies of life crisis/change have produced findings which cannot be related to healthy patterns of functioning. The determination of healthy patterns of life change was considered essential to the present study; therefore steps were taken to insure that a group of healthy individuals comparable to hospitalized subjects was available for purposes of comparing and contrasting results (see Chapter II for further discussion).

Experimental Hypotheses

Prior to data collection, eight experimental hypotheses were formulated which reflect the emphasis upon family-marital variables along several dimensions. One set of hypotheses focuses upon family-marital functioning as related to both severity and immediacy of illness. Another set of hypotheses predicts differences in family-marital functioning between a healthy group of individuals and a hospitalized group. A third set of hypotheses deals with predicted relationships between the two measures of family-marital functioning in both healthy and hospitalized groups.

Hypothesis 1: Among hospitalized subjects, family-marital sources of life change will be more highly associated with near-future illness severity than any other area of life change.

Hypothesis 2: Among hospitalized subjects, a significant inverse relationship will be found between marital adjustment and severity of near-future illness.

Hypothesis 3: Among hospitalized subjects, a significantly greater magnitude of family-marital life change will be found in comparison with a control group of healthy subjects.

Hypothesis 4: Among hospitalized subjects, significantly lower levels of marital adjustment will be found in comparison with a control group of healthy subjects.

Hypothesis 5: Among hospitalized subjects, a significant inverse relationship will be found between magnitude of family-marital life change and length of time between life crisis period and subsequent onset of illness.

Hypothesis 6: Among hospitalized subjects, a significant positive relationship will be found between marital adjustment levels and length of time between life crisis period and subsequent onset of illness.

Hypothesis 7: Among hospitalized subjects, a significant inverse relationship will be found between marital adjustment levels and magnitude of family-marital life change.

Hypothesis 8: Among healthy subjects, a significant inverse relationship will be found between marital adjustment levels and magnitude of family-marital life change.

Chapter II will outline the means whereby the validity of these hypothesized outcomes was determined.

CHAPTER II METHODOLOGY

The methodological sequence of data collection and analysis in the present study was relatively straightforward. The following discussion will describe the procedures employed in collecting data and in subsequently determining the validity of the eight experimental hypotheses. Discussion will focus upon various procedural aspects of the study, including the instruments employed in data collection, an operational restatement of the experimental hypotheses, the criteria and procedures applied in procuring the sample, and the statistical procedures employed in analyzing the data.

Data Collection Instruments

Three instruments were used in the present study to generate the necessary data upon which the hypotheses could be verified or rejected. These instruments provided quantitative data in the following areas: (1) overall patterns of life change; (2) family-marital patterns of change; (3) marital adjustment; (4) severity of illness; and (5) illness history.

Overall Patterns of Life Change

An overall assessment of life change for each participant in the study was obtained through administration of the Schedule of Recent Experiences (SRE). As described in Chapter I, the SRE is a systematic inventory of 42 stressful life events which necessitate greater or lesser amounts of adaptation for most individuals. The form of the SRE used in the present study incorporated corresponding LCU weights derived by Holmes and Rahe (1967). (See Appendix I).

The 42 life change events have recently (Rahe, 1972) been grouped into four major areas of life adjustment: family, personal, work, and financial (see Appendix II). In order to facilitate data analyses (to be described below), Rahe's work and financial areas were combined into a single category designated as the occupational-financial category. In order to provide a more descriptive nomenclature for the remaining two categories, items listed within the family area by Rahe were designated as the family-marital category, and items included within Rahe's personal area were designated as the personal-environmental category. The only change in Rahe's item arrangement was the removal of the item "sexual difficulties" from his personal area into the family-marital category of the present study. This change was based on the fact that subjects in the present study were married; therefore it was assumed that sexual difficulties occurred within the context of marital relationship.

The revised categories and corresponding item listings are presented in Appendix II.

Two additional SRE categories were introduced into this study, each embodying a different method of tabulating LCU values. The combined total category of life change reflects the LCU total for all endorsed events taken over all six-month intervals indicated by the subject. This scoring method is identical to the method used in life change studies cited in Chapter I and has been used in this study as an index of total readjustment impact over time. However, the combined total category potentially contains an overbalance of LCU values, and hence this category may present a distorted view of required social readjustment. For example, if a subject were to endorse "a change in the number of family get-togethers" as having occurred during each of four six-month intervals prior to testing, his LCU score for that event would total 60 rather than a single occurrence value of 15. In using the combined total scoring method, previous researchers have assumed that a constant amount of social readjustment is required regardless of the total time interval during which the change occurred.

The event total scoring method was devised for use as an alternative tabulation procedure. The underlying premise for invoking this procedure is that only a finite amount of readjustment is required for a given event, regardless of the duration of that event. Scores within the

event total category were thus derived by summing LCU values for each endorsed event regardless of recurrence during subsequent six-month intervals. Subsequent to data collection, these two scoring categories were compared in terms of respective associations with other variables of interest in the study (see Chapter III).

Subjects were asked to complete the SRE for the two years prior to administration of the questionnaire. This two-year period was partitioned into four six-month intervals, and each subject was asked to indicate the interval or intervals during which each life change event occurred.

Reliability estimates for SRE usage have ranged from as low as .26 (Thurlow, 1971) to .90 (McDonald et al., 1972). Rahe (1974) attributed this large variation to five factors: (1) time interval between administrations of the questionnaire; (2) educational level, and probable intelligence level, of subjects; (3) time interval over which subjects' recent life changes may be measured; (4) wording and format of various life event questions; and (5) sequence in which life event questions appear on the questionnaire. Regarding these sources of variation, Rahe (1974) elaborated on time intervals:

When the time interval between questionnaire administrations was two weeks, the test-retest correlation was .90; when the interval was eight months, the correlations ranged between .64 to .74; a ten-month interval gave correlations of .26.

(Rahe, 1974, p. 16)

Commenting on educational factors, Rahe noted:

Highest correlations were obtained from graduate students in psychology (.90) and physicians (.64 to .74). Intermediate correlations were obtained from military enlisted men (.55 to .61). The extremely low correlation of .26 was obtained from brewery workers.

(Rahe, 1974, p. 16)

Rahe noted that when subjects reported life changes for yearly intervals rather than six-month intervals, reliability increased. He further indicated that questions with modifiers, e.g., *major* or *a lot more*, and questions with intricate formats were less reliably answered than questions presented without qualifiers or more simply. In discussing item sequence on the SRE, Rahe pointed out that "since many of the life change questions proved to be highly intercorrelated, test-retest reliability was seen to be enhanced by [ordering] the questions by interrelated clusters than by LCU score" (Rahe, 1974, p. 16).

While a test-retest reliability procedure would have undoubtedly enhanced the methodological soundness of the present study, the logistic requirements of that task were deemed excessive. It was estimated that reliability values in the present study would approximate those found among military enlistees cited by Rahe. Although Rahe's (1974) comments on the factors limiting the reliability of the SRE are well taken, these same factors are likewise delimiting to other social measurement scales, many of which boast

nonetheless substantial reliability coefficients. Despite the seemingly marginal nature of the SRE's reliability, no other demonstrated measure of life change was available at the time of this study. Proceeding on the premise that SRE data were considerably better than no data, the issue was set aside until conclusions could be ascertained from the results (see Chapter IV).

Few estimates of the validity of the SRE have been offered. Rahe (1974) contended that when life change information has been obtained both by interview and by questionnaire, "the interviewers have been invariably impressed that the information obtained by questionnaire is a valid although a conservative estimate of subjects' recent life change experience" (Rahe, 1974, pp. 14-15). Citing unpublished research in which 140 patients completed the SRE while their spouses completed a separate questionnaire as if the spouse were the patient, Rahe (1974) showed that, despite the fact that many spouses did not know all of the mate's recent life changes, interpair correlations ran between .50 and .75 over the one- to two-year period immediately prior to study. Other unpublished research cited by Rahe (1974) indicated that when life events were carefully dated by interviewers and confined to events that both husband and wife knew about, interpair correlations ran as high as .78. Rahe concluded that "the SRE questionnaire is a moderately valid measure, but less valid and more conservative

than an interview" (Rahe, 1974, p. 15).

Measurement of Family-Marital Functioning

Two measurement procedures were employed in the assessment of family-marital functioning. The first, a more quantitative measure, consisted of the family-marital items on the SRE. A second measure, the Locke-Wallace Short Marital Adjustment Test (SMAT), provided a more qualitative perspective with regard to marital functioning. A description of both measures follows.

As mentioned above, the family-marital category of life change was derived from Rahe's (1972) classification system of all SRE life event items. Fifteen items pertaining to stressful family and marital change were included in this category, accounting for 47.8% of the possible LCU total. The personal-environmental and occupational-financial categories accounted for 27.7% and 24.5% of the remaining possible LCU total, respectively.

The Locke-Wallace SMAT was developed by Locke and Wallace (1959) to provide a shortened form for assessing marital adjustment without appreciable loss in reliability or validity from longer adjustment tests (e.g., Burgess-Wallin Marital Success Schedule, Locke Marital Adjustment Test). The SMAT contains 15 items, with possible scores ranging from 2 to 158 points. Locke and Wallace concurrently reported a reliability and validity study with the SMAT

in which couples receiving marital counseling as well as those judged exceptionally well adjusted were asked to complete the test. The reliability was found to be .90 as computed by the split-halves technique. An arbitrary cutoff point of 100 was found to differentiate significantly between the two groups.

Not atypically, the sample employed by these researchers to test the reliability and validity of the SMAT was predominantly white, middle class, and well educated. In contrast, the sample used in the present study reflected more modest socioeconomic and educational attainment. Hence, the Edmonds correction scale, consisting of 15 marriage-related items, was incorporated into the SMAT to correct for serendipitous response tendencies often observed in this population. The SMAT with the incorporated Edmonds items is shown in Appendix III.

The Seriousness of Illness Rating Scale (SIRS) was developed by Wyler et al. (1968) to provide a quantitative measure of illness severity. A total of 258 medical and nonmedical respondents were asked to rate 126 diseases as to relative seriousness. An arbitrary value of 500 was assigned to peptic ulcer, with respondents quantitatively rating the remaining diseases as more or less serious. No appreciable difference in severity ratings was found between medical and nonmedical samples; hence the data were pooled to obtain a total sample mean for each disease. Each

hospitalized subject was assigned an SIRS score on the basis of primary diagnosis according to the total sample means described above. The SIRS disease items and the respective mean severity ratings are listed in Appendix IV.

Disease items on the SIRS were also employed in constructing the Health History Inventory (HHI), a measure of different illness episodes during five years prior to the present study. A number of the more common, less serious disease items on the SIRS (corns, hiccups, bad breath) were deleted in devising the inventory, leaving only more infrequent and medically significant illnesses for inclusion. A Health History Inventory score was computed for each subject by assigning SIRS values to each disease item endorsed and then summing these values into a single total. The Health History Inventory is shown in Appendix V.

Immediacy of Illness Onset

Having characterized the concept of immediacy of illness onset as a promising, innovative variable which might serve to broaden the scope of illness measurement, the less glamorous task of operationalizing this variable was undertaken. Immediacy of illness as alluded to by Rahe (1968) consisted of the elapsed time between the period of greatest life change (the "life change crisis period") and the time at which a subsequent illness was reported. Rahe described this elapsed time interval in terms of months, but

the use of such a large time unit was seen as inexact and therefore unsuitable for the present study. Instead, the number of days which elapsed between the midpoint of the six-month life change crisis period and subsequent onset of illness was selected as the measurement modality. Unfortunately, determination of a precise date of onset proved to be a deceptively simple process.

Prior to data collection it was presumed that information necessary for determining a relatively precise date of onset for all hospitalized subjects would be contained in medical records. Soon after data collection began, however, this presumption was reassessed in light of the virtual absence of such information in the records. It was then decided that, in addition to medical record checks, the patients themselves would be queried as to the date when symptoms first became noticeable. After several efforts in this direction, it became evident why the medical records lacked such information: Many of the patients interviewed were unable to pinpoint, or even estimate, the time at which symptoms began to appear or, as was often the case, to reappear.

Almost all patients for whom a date of onset could not be determined fell within one or more of the following categories: (1) too ill, (2) too medicated, and (3) too physically or emotionally depleted. In a few instances the symptoms associated with illness were neither precipitous

in appearance nor well defined, thereby precluding any accurate and reliable determination of onset date.* In some cases the date of onset could be determined from medical records. Eventually, however, only 30 of the 51 patients in the study were assigned what was felt to be a reasonably accurate date of onset.

The Sample

Two populations were sampled in the present study. The first sample was drawn from a population of hospitalized patients; the second, from a population of healthy individuals.

The Hospitalized Sample

The hospitalized sample was obtained from the Veterans Administration Hospital in Gainesville, Florida, during the Spring Quarter, 1974. Patients were selected on the basis of sex, race, diagnostic classification, age and marital status characteristics. Each of these criteria will be discussed briefly.

Sex.--Due to the nature of the population receiving treatment at the Gainesville veterans hospital, all members of the sample were male. As such, the sample was one of convenience inasmuch as the overwhelming majority of patients

*In answering the author's query as to date of onset, one patient responded, with some irritation, that his symptoms were his doctor's problem, not his.

at the VA Hospital are male. However, the selection of an all-male sample was conservative in nature, at least if the findings of Holmes and Holmes (1970) are valid for the population presently under study. Females in that study were more symptomatic in relation to day-to-day life change than were males.

Race.--Based on the findings of Wyler et al. (1971), black Americans appear to differ with regard to baseline life change patterns, suggesting that LCU ratings derived by Holmes and Rahe (1967) do not hold up reliably for blacks. Since the issue of racial differences was not resolved in the literature and exceeded the scope of the present study, only white American-born subjects were selected for participation in this study.

Diagnosis.--As noted earlier, Wyler et al. (1971) found a significant relationship between life change and illness among the chronically ill, while no such relationship was found among those diagnosed as acutely ill. Hence, for purposes of the current study, only those diagnosed as chronically ill were included in the sample. It was found that the definition of chronic illness has been difficult to specify. Some direction was offered by Dodge and Martin (1970), who identified some general characteristics of chronicity.

In using the term "chronic diseases" we adhere to the principle that the term indicates a long duration of the disease process in contrast to that process associated with the acute diseases. Beyond

this stipulating it is difficult to maintain a sharp differentiation between the two groups of diseases as we use them. If we employ the criteria of infectiousness or communicability, it can be noted that some chronic diseases, like the acute diseases, involve known pathogenic microorganisms and are communicable. If we point out that chronic diseases usually leave residual disabilities and generally require extensive periods of recovery or rehabilitation, undoubtedly a few acute diseases can be found with these characteristics. However, it must be noted that these factors when associated with chronic diseases are generally, but not in every case, more of a certainty, more extensive, severe, and more often nonreversible.

(Dodge & Martin, 1970, p. 78)

A number of the disease items listed on the SIRS were clearly acute in nature, e.g., sunburn, shark bite, chicken pox, etc. All disease items on the SIRS were reviewed by the physician consultant to the study, who employed the criteria for chronicity cited above in determining which SIRS items could be clearly designated as chronic.*

Age.--The relationship between life change and illness has heretofore been found in other studies to be generally constant across all age groups. However, because of the chronic nature of the diagnostic criteria, the minimum age for inclusion in the study was 25; the ceiling age was set at 65. Both age criteria were somewhat arbitrary in nature. However, the inclusive age range defined by these two boundary

*Several items which fall under the general rubric of psychiatric disorders were found among the SIRS listings. Previous life crisis research has implied little, if any, distinction between such classical psychiatric syndromes as manic-depression or schizophrenia and physiological disease entities. Indeed, the evidence linking psychotic disorders to chemical and metabolic alterations in the body is con-

ages was expected to demonstrate a generally uncomplicated picture of chronic illness as related to life change.

Marital status.--In order to obtain adequate information regarding family-marital functioning, it was necessary to establish marital criteria for inclusion in the study. One year of marital contact was considered minimal. The criteria were as follows: All members of the hospitalized sample were to have been married for at least one year during the two-year period prior to data collection. Thus included were persons who had become divorced or legally separated and persons whose wives had died during the year prior to the study. Also included were individuals who had been newly married for at least one year prior to the study. Participants were not required to have been married for the full two-year period prior to the study because some of the most heavily weighted SRE items included death of spouse, separation, or marriage.

The Control Group

The rationale in forming a control group was to provide a means of comparison between life change/marital

vincing. However, the undifferentiated inclusion of psychiatric disorders with illness stemming from physiological pathology presupposes an etiologic and qualitative similarity which, to the author's knowledge, has not been conclusively demonstrated. Therefore, the present study focused upon cases of chronic illness in which the presenting symptomatology was judged to emanate primarily from physiological pathology.

adjustment patterns between hospitalized and healthy populations. The control group employed in the present investigation was matched with the hospitalized group insofar as age, sex, race, marital status, and education were concerned. That is, sample selection was made to insure that group differences between the two samples would not differ significantly with regard to these five dimensions. In addition, all control group participants were required to be eligible for treatment at the Gainesville VA Hospital and to live within the hospital's catchment area. Only individuals who had not been hospitalized during five years prior to the study were designated as eligible to participate. Data from the control group were collected during the same period that data were received from the hospitalized group. The control group was intended to consist of approximately the same number of healthy veterans as the hospitalized group. Because the battery of questionnaires required moderate ability in reading comprehension, subjects in both samples were required to have at least a tenth-grade education.

Procedural Format

The following section will outline the procedures employed in identifying subjects for the sample and collecting data.

Data Collection Within the Hospitalized Group

In order to be selected to participate in the study,

each patient was required to meet the demographic criteria described above. The physician consultant to the study assisted in screening prospective subjects to verify compliance with the criteria for inclusion. Screening was accomplished by periodic medical record reviews on each of the medicine and surgery wards in the hospital.

When an eligible patient was identified, he was contacted by a member of the research team who briefly described the nature of the research project. Each prospective subject was assured that all information would remain confidential. Patients agreeing to participate were asked to complete an information sheet including the patient's age and educational attainment, admitting diagnosis, date of admission, and marital information (see Appendix VI).

If the prospective patient met the minimal educational requirements for participation, he was then given a battery of questionnaires consisting of a consent agreement, Health History Inventory, SRE, and SMAT to complete at his convenience. Each participant was requested to avoid collaboration with others in completing the questionnaires. At the time of the patient's discharge, the patient's medical record was reviewed to insure that the primary diagnosis was not changed during hospitalization. If the primary discharge diagnosis differed from the primary admitting diagnosis, the former was used in determining illness severity. In a few instances the primary discharge diagnosis differed from the

admitting diagnosis and did not appear among the chronic disease items designated on the SIRS. In these instances the patient was dropped from the study.

Data Collection Within the Control Group

Participation in the control group was contingent upon meeting the demographic criteria employed in selecting hospitalized subjects, i.e., criteria pertaining to age, sex, race, marital status, and education. The questionnaires administered to control group participants were identical to those given to the hospitalized group. All participants were assured of anonymity.

Two sources of data were employed to assemble the control group. The first source consisted of VA-affiliated veterans' groups in Ocala, Orlando, and Daytona Beach, Florida. The writer attended meetings at each site and delivered a short presentation to each group, describing the nature of the study and the criteria for participation. All eligible members were then requested to support the project by completing the battery of questionnaires following the meeting. Attendance at these meetings netted a total of 36 subjects for the control group.

The second source of control group data was an advertisement in the *Gainesville Sun*, the major local daily newspaper, briefly describing the study and the requirements for participation and inviting interested persons to respond. A

telephone number was provided for further inquiries. Telephone respondents were given a more detailed description of the study and were asked to complete a questionnaire in person at the VA Hospital. Respondents agreeing to participate were given an appointment at their convenience. Subjects appearing for appointments were ushered to an unoccupied office where instructions for completing the questionnaire were given. A total of 20 subjects participated in this manner.

Operational Specifications

In order to adequately test the experimental hypotheses advanced at the conclusion of Chapter I, a more precise operational formulation of each hypothesis was required to insure that all hypotheses could be evaluated through use of the above-mentioned instruments and measurement techniques, as well as to facilitate subsequent interpretation of the results. Hence the eight hypotheses were restated in the following operational terms:

Hypothesis 1: Among members of the hospitalized sample, a higher positive correlation will be found between LCU values within the family-marital category of the SRE and corresponding SIRS values in comparison with correlations between the remaining SRE categories and SIRS values.

Hypothesis 2: Among members of the hospitalized sample, a significant inverse correlation will be found between SMAT scores and corresponding SIRS values.

Hypothesis 3: Among members of the hospitalized sample, significantly larger LCU values will be

found within the family-marital category of the SRE in comparison with the same values among members of the control sample.

Hypothesis 4: Among members of the hospitalized sample, significantly lower SMAT scores will be found in comparison with the same scores among members of the control sample.

Hypothesis 5: Among members of the hospitalized sample, a significant inverse correlation will be found between LCU values within the family-marital category of the SRE and corresponding immediacy of onset values expressed in number of days.

Hypothesis 6: Among members of the hospitalized sample, a significant positive correlation will be found between SMAT scores and corresponding immediacy of onset values expressed in number of days.

Hypothesis 7: Among members of the hospitalized sample, a significant inverse correlation will be found between SMAT scores and corresponding LCU values within the family-marital category of the SRE.

Hypothesis 8: Among members of the control sample, a significant inverse correlation will be found between SMAT scores and corresponding LCU values within the family-marital category of the SRE.

The directionality of predicted results in the above hypotheses required a one-tailed test of statistical significance. The .05 level of significance was selected as the criterion value for acceptance or rejection of each hypothesis.

Data Analysis

Nine separate statistical analyses were planned in the present study. The first eight were conducted in conjunction with each of the eight experimental hypotheses.

The ninth analysis compared differences between hospitalized and control groups regarding age and education. The data derived from both SRE and SMAT were ordinal in nature; thus, nonparametric statistical analyses of this data were indicated. The analysis of demographic data between the two groups were based on equal-interval data, thus permitting the use of parametric statistical procedures. All statistical computations were performed by computer.

Hypotheses 1 and 2

The Spearman rank correlation procedure was employed to test Hypotheses 1 and 2. To test Hypothesis 1, five correlations were computed, one for each of the SRE categories and corresponding SIRS scores. Within each of the five correlational analyses, subjects were ranked in ascending order according to the magnitude of mean LCU scores. Each subject was also assigned an ascending SIRS ranking based on the magnitude of the SIRS score associated with his diagnosis. Differences between the five SRE category rankings and the corresponding SIRS rankings were computed in deriving the respective correlation coefficients. A similar analysis was performed in conjunction with Hypothesis 2, with SMAT and SIRS values being rank ordered and compared in generating the correlation coefficient between marital adjustment and illness severity.

Hypotheses 3 and 4

The family-marital LCU totals from the SRE and the SMAT scores were compared between subjects in the hospitalized and control groups to test Hypotheses 3 and 4. Statistical analysis of the data was performed by using the Mann-Whitney test. Family-marital and SMAT scores from the combined samples were listed in rank order according to respective magnitudes. The U statistic was then computed, and the level of significance for the differences determined.

Hypotheses 5 and 6

In conjunction with Hypothesis 5, the Spearman rank correlation procedure was employed in computing the correlation between scores from the five SRE categories and the corresponding immediacy of illness (II) values. Mean LCU scores were used to rank all subjects in ascending order. Each subject was also assigned an ascending II rank according to the number of elapsed days between the life crisis period and illness onset. Differences between the five SRE category rankings and the corresponding II rankings were employed in computing five correlation coefficients. The analysis performed in conjunction with Hypothesis 6 was similar, with SMAT and II scores being ranked and compared in computing the correlation coefficient.

Hypotheses 7 and 8

The Spearman correlation procedure was again employed

in analyses associated with Hypotheses 7 and 8. In this instance family-marital LCU values and SMAT scores were rank ordered in both the hospitalized and control groups. Correlation coefficients for both samples were derived from the computed differences in rank values.

Testing for Group Differences

A *t* test was employed to test for significant differences in age and education between the hospitalized and control groups.

Chapter III will present the results of the foregoing analyses as well as the demographic characteristics of both samples.

CHAPTER III

RESULTS

The results of the study will be presented in three sections. The first section will present the results of age and educational comparisons between hospitalized and control samples; the second section, the demographic characteristics for both samples; and the third section, the results of analyses performed in conjunction with the eight experimental hypotheses.

Demographic Comparisons Between Groups

The data collection process netted a total of 54 hospitalized group members and 56 control group participants. Compliance with criteria regarding sex, race, marital status, and minimal educational attainment was accomplished through discriminative sample selection procedures.* A *t* test was conducted with the hospitalized and control groups, analyzing

*Sex and race criteria were checked during the medical record review sessions, with noneligible patients being screened prior to contact. Information regarding educational background and marital status, however, was often omitted from medical records, necessitating personal contact with patients in question. A surprisingly large number of patients contacted for further educational and marital information did not meet minimum requirements for inclusion. In such cases the patient was thanked for his cooperation, and the contact was terminated.

age and educational data to determine if significant differences between the two groups existed with regard to either variable. When full-sample hospitalized and control age data were compared, it was found that differences in age between the two groups approximated the .05 level of significance (see Table 1). The analysis of full-sample educational data between the two groups revealed very significant differences, with educational attainment in the control group eclipsing that of the hospitalized group beyond the .0001 level of significance (see Table 1).

Because of large educational discrepancies between the two groups, upper-grade-level cutoff values were imposed upon both groups in an effort to minimize group differences. A cutoff level of 15 years of schooling minimized educational differences between the two samples; hence all members from both samples with more than 15 years of education were dropped, resulting in a loss of 3 members from the hospitalized group while 20 members from the original control sample were eliminated.* The resultant age and educational levels in the two groups (numbering 51 in the hospitalized group and 36 in the control group) were again compared by *t* test. Results of the two comparisons are shown in Table 1. The *t* value for the intergroup comparison of age was -.0007,

*Most of the control group members who were eliminated by the grade-level cutoff were respondents to the local newspaper ad. For the most part, these individuals were young military veterans with bachelor's degrees who had returned to the University of Florida to pursue graduate study.

TABLE 1
BETWEEN-GROUP COMPARISONS OF AGE AND EDUCATION

Full Sample

Variable	<i>n</i>	mean	S.D.	<i>t</i>	<i>p</i>
Age					
Hospital	54	49.68	3.94	1.59	NS
Control	56	46.29	12.95		
Education					
Hospital	54	12.53	1.88	3.60	.0001
Control	56	14.19	2.88		

Dropped Sample

Variable	<i>n</i>	mean	S.D.	<i>t</i>	<i>p</i>
Age					
Hospital	51	49.47	9.13	-.0007	NS
Control	36	49.47	11.25		
Education					
Hospital	51	12.09	1.23	-.1208	NS
Control	36	12.11	1.26		

while the comparison of educational level between the two groups yielded a *t* value of -.1208. Both values were notably nonsignificant.

One further comparison was undertaken to determine if the two newly formed groups differed significantly with regard to illness history. Health history totals were thus compared between the two groups through the use of the Mann-Whitney U test. As may be seen in Table 2, the health history totals reported by the hospitalized group significantly exceeded those reported by members of the control group, with the statistical significance of the differences falling well beyond the .001 level.

Demographic Characteristics of the Samples

The most notable demographic characteristics of both the hospitalized and control groups were compiled (see Tables 3, 4, and 5, and Figure 1). These data pertain to family and marital history, employment status, and age distribution within the two samples as well as to diagnostic classification within the hospitalized group.

An analysis of Table 3 reveals that, in general, participants in the hospitalized group experienced a more disrupted, disorganized family and marital history than did control group counterparts. For example, 42% of hospitalized group veterans had been divorced at least one time; 22% of control group members reported a previous divorce. Of

TABLE 2
A COMPARISON OF HEALTH HISTORY TOTALS

Variable	<i>n</i>	<i>z</i>	<i>p</i>
Health History			
Hospital	51	5.541	.001
Control	34		

TABLE 3
A COMPARISON OF MARITAL HISTORY INFORMATION

	Hospitalized Group	Control Group
Subjects reporting previous divorces	42%	22%
Wives' previous divorces (subjects' reports)	36%	36%
Subjects reporting separations from previous wives	30%	11%
Subjects reporting separations from present wives	6%	0%
Subjects reporting divorces among parents	21%	16%

the hospitalized group, 6% reported having been legally separated from the present wives, and 30% had been separated from previous wives. In contrast, none of the veterans in the control group had been legally separated from current spouses, while 11% reported separations from previous wives. Interestingly enough, veterans in both groups reported an identical percentage of previous divorces among present wives (36%). Of the hospitalized group, 21% reported at least one divorce between parents, compared with a 16% parental divorce rate reported by control group members.

Both groups reported a substantial rate of unemployment (see Table 4). Hospitalized group members reported a 47% rate of unemployment; control group members reported a 36% unemployment rate. Among those who reported being unemployed, hospitalized subjects had been out of work for an average of 44.2 months, whereas subjects in the control group had been unemployed for an average of 12.8 months. An analysis of age distribution within the two groups (see Figure 1) reveals a somewhat similar pattern of age clusters. Within the hospitalized group, 45% of all participants fell within the 42-49 age bracket, while 50% of control group members were encompassed within the 50-57 age interval. Above age 40 were 88% of the hospitalized and 77% of the control group. Fourteen chronic disease entities were represented in the hospitalized group (see Table 5), with cancer, arteriosclerosis, peptic ulcer, and kidney disease accounting for the major sources of affliction.

TABLE 4
A COMPARISON OF EMPLOYMENT INFORMATION

	Hospitalized Group	Control Group
Subjects reporting unemployment at time of study	47%	36%
Average elapsed time since last employment among unemployed subjects	44.2 months	12.8 months

TABLE 5
A CLASSIFICATION OF SUBJECTS ACCORDING TO DIAGNOSTIC CATEGORY

Diagnostic Category	Number of Subjects	Percent of Subjects
Cancer	9	17%
Hardening of the arteries	7	13%
Peptic ulcer	6	12%
Uremia	6	12%
Leukemia	5	10%
High blood pressure	4	8%
Chest pain	4	8%
Heart failure	3	6%
Cirrhosis	2	4%
Arthritis	1	2%
Diarrhea	1	2%
Pancreatitis	1	2%
Bronchitis	1	2%
Diabetes	1	2%

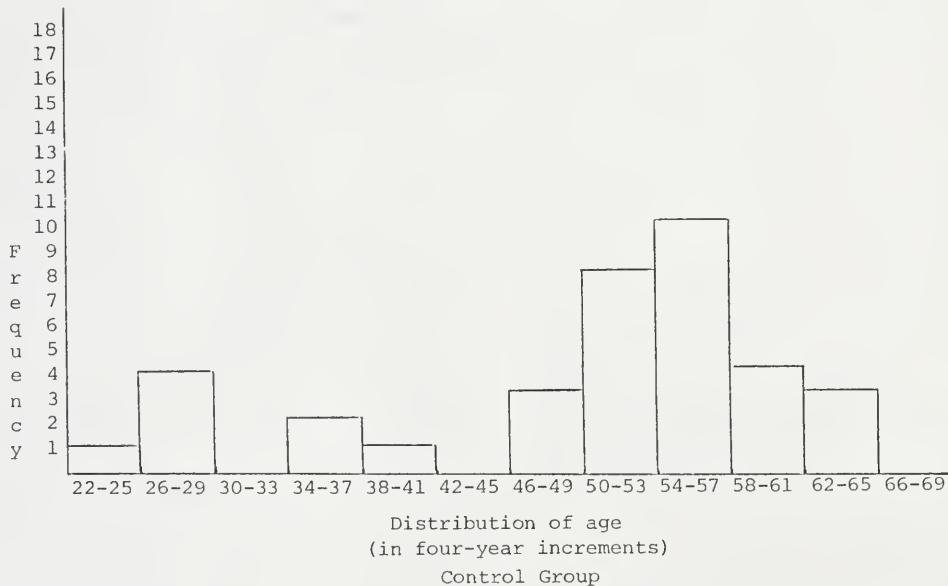
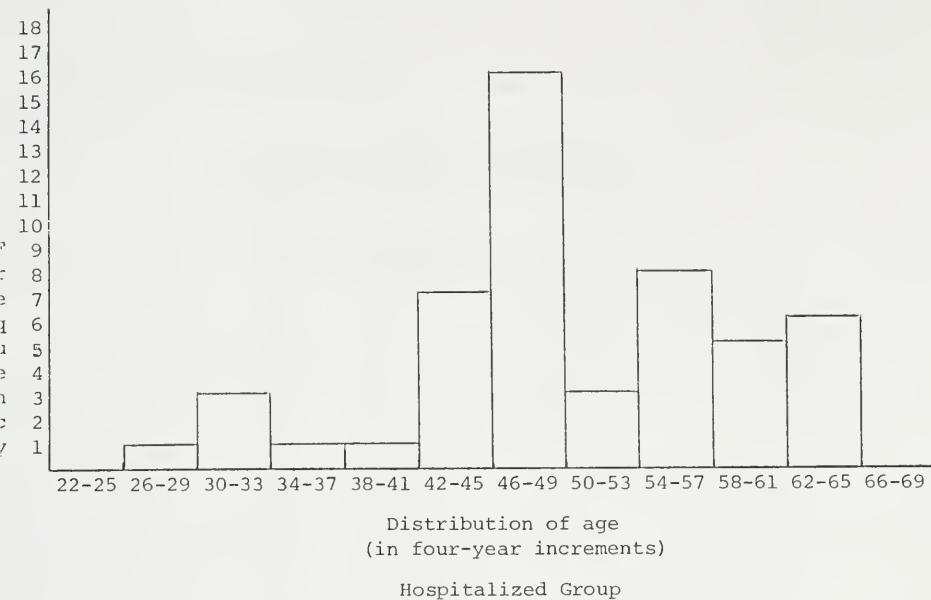


Figure 1. Distribution of age (Hospitalized and Control Groups)

Comparisons Associated with Hypotheses

Hypothesis 1 predicted that, in the hospitalized group, the correlation between SRE family-marital LCU values and SIRS values would be larger than corresponding correlations between the remaining four life change categories and illness severity. A Spearman correlation coefficient was computed between each of the five SRE category LCU scores and corresponding SIRS values within the hospitalized group (see Table 6). Inasmuch as the correlation between family-marital life change scores and severity of illness values was the lowest of the five computed correlations, Hypothesis 1 was not confirmed.

Hypothesis 2 predicted that an inverse correlation would be found between Locke-Wallace SMAT scores and corresponding SIRS values for the hospitalized sample. To test the hypothesis, the Spearman correlation was computed between SMAT scores and SIRS values. The correlation coefficient between these two variables was found to be -.076, which was statistically nonsignificant (see Table 7). Hence Hypothesis 2 was not confirmed.

Hypothesis 3 predicted that a larger amount of family-marital life change would be found in the hospitalized group than in the control group. In order to test this assumption, the Mann-Whitney U test was employed to compare family-marital LCU totals between the two groups (see Table 8). Family-marital totals in the hospitalized group were

TABLE 6
 CORRELATIONS BETWEEN
 SRE LIFE CHANGE CATEGORY SCORES AND SIRS VALUES
 (Hospitalized Group)

SIRS Values	Family- Marital	Personal- Environmental	Occupational- Financial	Combined Total	Event Total
<i>n</i>	51	51	51	51	51
<i>r</i>	.149	.312	.192	.255	.197
<i>p</i>	NS	.025	NS	.05	NS

TABLE 7
 CORRELATION BETWEEN
 LOCKE-WALLACE SMAT/CONVENTIONALITY SCORES AND SIRS VALUES
 (Hospitalized Group)

SIRS Values	Locke-Wallace Score	
	SMAT	Conventionality
<i>n</i>	51	51
<i>r</i>	-.076	-.030
<i>p</i>	NS	NS

indeed found to exceed totals within the control group. The computed z score was significant at the .067 level. While the difference was found to approach statistical significance, the .05 level was not attained.

Hypothesis 4 predicted that subjects in the hospitalized group would report lower Locke-Wallace SMAT scores than subjects in the control group. The Mann-Whitney U test was again employed to test for significant differences between SMAT scores within the two groups. The z score was found to be significant at the .044 level (see Table 9) thereby confirming the hypothesis.

Hypothesis 5 predicted that, within the hospitalized group, an inverse correlation would be found between family-marital LCU scores and immediacy of illness onset values. To test the hypothesis, the Spearman correlation was computed between these two variables (see Table 10). A correlation of -.311 was found between the two variables, significant beyond the .05 level, which confirmed the hypothesis.

Hypothesis 6 predicted that, among hospitalized subjects, a positive correlation would be found between marital adjustment scores and immediacy of illness onset. The Spearman correlation procedure was again employed to determine the correlation between Locke-Wallace SMAT scores and immediacy of illness onset values. The SMAT scores were found to correlate .089 with the immediacy of onset values, which was not statistically significant (see Table 11). Therefore Hypothesis 6 was not confirmed.

TABLE 8
A COMPARISON OF SRE LIFE CHANGE CATEGORY SCORES

SRE Category	Hospital	Control	z	p
	n	n		
Family-marital	51	34	1.501	.067
Personal-environmental	51	34	1.565	.057
Occupational-financial	51	34	-.355	.364
Combined total	51	34	2.131	.012
Event total	51	34	2.848	.002

TABLE 9
A COMPARISON OF LOCKE-WALLACE SMAT/CONVENTIONALITY SCORES

Locke-Wallace Score	Hospital	Control	z	p
	n	n		
SMAT	51	36	-1.707	.044
Conventionality	51	36	1.440	.075

TABLE 10
 CORRELATIONS BETWEEN
 SRE LIFE CHANGE CATEGORY SCORES
 AND IMMEDIACY OF ILLNESS ONSET DATA
 (Hospitalized Group)

Immediacy of Illness Onset	Family-	Personal-	Occupational-	Combined	Event
	Marital	Environmental	Financial	Total	Total
<i>n</i>	30	30	30	30	30
<i>r</i>	-.311	.261	-.309	.007	.085
<i>p</i>	.025	.05	.025	NS	NS

TABLE 11
 CORRELATION BETWEEN
 LOCKE-WALLACE SMAT/CONVENTIONALITY SCORES
 AND IMMEDIACY OF ILLNESS ONSET DATA
 (Hospitalized Group)

Immediacy of Illness Onset	SMAT	Locke-Wallace Score
		Conventionality
<i>n</i>	30	30
<i>r</i>	.089	.179
<i>p</i>	NS	NS

Hypothesis 7 predicted that, within the hospitalized group, an inverse correlation would be found between Locke-Wallace SMAT scores and family-marital LCU scores. The Spearman correlation coefficient was computed between the two variables to test this assumption. A correlation of -.369 was found significant beyond the .001 level (see Table 12). Thus, Hypothesis 7 was confirmed.

Hypothesis 8 predicted that an inverse correlation would also be found between Locke-Wallace SMAT scores and family-marital LCU scores in the control group. The Spearman correlation was found to be -.201 between the two variables (see Table 12), which was nonsignificant. Predicted results not having been obtained, Hypothesis 8 was not confirmed.

A more detailed discussion of these results, as well as a discussion of other findings of interest in the study, will be presented in Chapter IV.

TABLE 12
 CORRELATIONS BETWEEN
 SRE LIFE CHANGE CATEGORY SCORES
 AND LOCKE-WALLACE SMAT/CONVENTIONALITY SCORES
 (Hospitalized Group)

Locke-Wallace Score	SRE Category					
	Family-Marital	Personal-Environmental	Occupational-Financial	Combined Total	Event Total	
SMAT						
<i>n</i>	51	51	51	51	51	51
<i>p</i>	-.369	.104	-.118	-.216	-.291	
<i>r</i>	.001	NS	NS	NS	.025	
Conventional						
<i>n</i>	51	51	51	51	51	51
<i>r</i>	-.413	.154	-.145	-.250	-.246	
<i>p</i>	.001	NS	NS	.05	.05	

(Control Group)

Locke-Wallace Score	SRE Category					
	Family-Marital	Personal-Environmental	Occupational-Financial	Combined Total	Event Total	
SMAT						
<i>n</i>	34	34	34	34	34	34
<i>p</i>	-.201	.098	-.053	-.073	-.112	
<i>r</i>	NS	NS	NS	NS	NS	
Conventional						
<i>n</i>	34	34	34	34	34	34
<i>p</i>	-.026	-.042	-.014	-.053	-.081	
<i>r</i>	NS	NS	NS	NS	NS	

TABLE 13
CORRELATIONS BETWEEN
AGE AND LOCKE-WALLACE SMAT/CONVENTIONALITY SCORES

Age	Locke-Wallace Scores	
	SMAT	Conventionality
Hospital		
<i>n</i>	51	51
<i>r</i>	.417	.307
<i>p</i>	.001	.025
Control		
<i>n</i>	36	36
<i>r</i>	.247	.074
<i>p</i>	NS	NS

TABLE 14
CORRELATIONS BETWEEN
SIRS SCORES AND PREMORBID LCU TOTALS
(Hospitalized Group)

SIRS Scores	Premorbid LCU Totals			
	19-24 Months	13-18 Months	7-12 Months	0-6 Months
<i>n</i>	51	51	51	51
<i>r</i>	.185	.099	.257	.292
<i>p</i>	NS	NS	.05	.025

TABLE 15
CORRELATIONS BETWEEN
HEALTH HISTORY TOTALS AND SRE/SMAT SCORES

Health History	SRE Life Change Categories						Locke-Walace Score	
	Family-Marital	Personal-Marital	Environmental	Occupational Financial	Combined Total	Event Total	SMAT	Conventional
Hospital								
<i>n</i>	50	50		50	50	50	50	50
<i>r</i>	.264	.329		.012	.250	.202	.175	.107
<i>p</i>	.05	.01		NS	.05	NS	NS	NS
Control								
<i>n</i>	33	33		33	33	33	33	33
<i>r</i>	-.063	-.127		-.205	-.149	-.163	.051	.057
<i>p</i>	NS	NS		NS	NS	NS	NS	NS

TABLE 16
POINT-BISERIAL CORRELATIONS BETWEEN
SRE/SMAT VARIABLES AND HOSPITALIZATION

Hospitalization/Non-hospitalization	SRE Life Change Categories						Locke-Walace Score	
	Family-Marital	Personal-Marital	Environmental	Occupational Financial	Combined Total	Event Total	SMAT	Conventional
Hospitalization								
<i>n</i>	85	85		85	85	85	87	87
<i>r_{pb}</i>	.22	.46		.05	.32	.35	.19	.13
<i>p</i>	.025	.0001		NS	.005	.001	.05	NS

TABLE 17
CORRELATIONS BETWEEN
SUBJECTS' AGE AND OTHER VARIABLES OF INTEREST

	Subjects' Age					
	Hospital			Control		
	n	r	p	n	r	p
Health history totals	50	.255	.05	35	.320	.05
Family-marital LCU totals	51	.114	NS	34	-.235	NS
Personal-environmental LCU totals	51	-.005	NS	34	-.502	.01
Occupational-financial LCU totals	51	-.184	NS	34	-.386	.025
Combined total LCU totals	51	-.185	NS	34	-.448	.01
Event total LCU totals	51	-.227	NS	34	-.469	.01

TABLE 18
INTERCORRELATIONS AMONG THREE ILLNESS VARIABLES

Variables Correlated	Spearman
	Correlation Coefficient
SIRS-Immediacy of illness onset	.004
SIRS-Health history totals	.176
Immediacy of illness onset- Health history totals	-.293

CHAPTER IV DISCUSSION

Results of the analyses presented in Chapter III merit further discussion and, where possible, interpretation. The present chapter will elaborate on these results with an emphasis on synthesizing the results into a more descriptive framework. Although not directly related to the hypothesized relationships or differences in the present study, other data analyses were undertaken in order to identify noteworthy findings which were not of primary concern at the outset of the study. A number of these results, tabulated in Tables 6 through 18, are central to a more comprehensive understanding of the etiology and demography of chronic illness; therefore, these results will be referred to as needed during the course of discussion.

Minimizing Group Differences

The establishment of educational attainment as the criterion variable for minimizing both educational and age differences between the hospitalized and control samples was effective. The two groups were similar in terms of level of educational attainment and age characteristics (mean and standard deviation) following the elimination

procedure. As expected, the two groups did differ with respect to health history totals; however, the magnitude of difference was larger than anticipated, suggesting that members of the hospitalized group had been beset by multiple major medical difficulties during the five-year period prior to the study while members of the control group were relatively illness-free during that time. Results of the above three comparisons indicate that the two groups were nearly identical as to age and educational background data, yet quite different insofar as prior illness rates are concerned. The fact that the hospitalized group was markedly illness-prone while the controls were relatively free of illness tends to strengthen a number of the conclusions offered below.

Comparison with Previous Life Change Studies

Several findings in the present study support important conclusions arising out of previous research. For example, veterans' combined total SRE scores (i.e., the total of all life change events regardless of recurrence) in the hospitalized sample were significantly higher than scores of counterparts in the control group (see Table 8).^{*} Coupled with the finding that hospitalized veterans' combined total

* The combined total SRE score was computed in the same manner as in all previous studies employing the SRE and is therefore useful in comparing SRE results in the present investigation to those in prior studies.

scores were significantly related to admission to the hospital (see Table 16), these higher scores lend further support to previous researchers' conclusions that life change and illness onset are significantly related. Furthermore, combined total scores among hospitalized participants were found to be correlated significantly with illness severity (see Table 6), supporting the conclusions of Rahe et al. (1967) that life change history is related to illness severity. Finally, as in the study by Wyler et al. (1971), the two six-month periods immediately prior to hospitalization were incrementally and significantly correlated with severity of illness (see Table 14). Hence a sense of continuity exists between current results and previous research findings. However, the modifications incorporated into the present design offered a number of additional findings which provide further insight into the illness process.

Family-Marital Variables in Relationship to Illness

The primary focus in the present study centered upon family-marital functioning as related to illness. Indeed all eight experimental hypotheses sought either to compare veterans' family-marital functioning between the hospitalized and control groups or to establish a relationship between family-marital life changes or marital adjustment and severity or immediacy of illness. The fact that three of these hypotheses were confirmed, while another closely

approximated confirmation, suggests that a given individual's family-marital experience is important to a broader understanding of illness etiology.

The first two hypotheses focused on the relationship between veterans' perceptions of family-marital experiences and the severity of subsequent illness. As noted earlier (see Chapter I), Hypothesis 1 sought to explore the quantitative aspects of this relationship through the measurement of family-marital life change, i.e., an inventory of event history which is relatively objective in nature. In contrast, Hypothesis 2 invoked the Locke-Wallace SMAT in an effort to provide a qualitative perspective on subjects' marital functioning through an assessment of subjects' perceptions of spouse and the marital experience itself. The lack of statistical significance associated with either analysis leads to the conclusion that, for the population under study, neither marital adjustment as perceived by individuals in the study nor incidence of family-marital life change was related to severity of illness to any appreciable degree.

Despite the fact that husbands' incidence of family-marital life change and perceptions of marital adjustment did not correlate significantly with illness severity, these two measures did differ between the hospitalized and control groups. As predicted by Hypothesis 3, family-marital life change occurred more frequently among hospitalized group

participants relative to change rates among control group members during the two-year period prior to study. While this difference was not statistically significant, it did approach significance. Marital adjustment levels were found to be significantly lower among hospitalized group members than among control group members.

Also of interest were results of a comparison of conventionality scores between the two groups (see Table 9). The two groups did not differ significantly in the degree to which members responded with an eye toward social convention. However, hospitalized veterans tended to respond to the SMAT in a more conventional manner than did members of the control group, but this trend was not of sufficient magnitude to support the conclusion that SMAT scores within the hospitalized group were significantly overly conventionalized in relation to control group scores. Based on these between-group comparisons of life change and marital adjustment, it may be concluded that substantial differences did exist between the two groups in terms of family-marital functioning.

Hypotheses 5 and 6 predicted that, within the hospitalized group, a significant relationship would be found between each of the two family-marital variables and the immediacy with which illness onset occurred. As far as Hypothesis 5 is concerned, veterans' reports of family-marital life change were significantly correlated with

immediacy of onset. Hence, when the incidence of family-marital change for a given individual was high, the time span between the six-month life change crisis period and illness onset tended to be shorter. On the other hand, the relationship between marital adjustment and immediacy of illness onset among hospitalized members, postulated by Hypothesis 6 to be significant, was not found significant.

Perceived marital adjustment was not found to correlate significantly with either of the two illness variables. Indeed, among the four correlations between the two measures of family-marital functioning and the dual parameters of severity of illness and immediacy of illness onset, only one (family-marital life change-immediacy of illness) emerged as statistically significant.

The final two hypotheses predicted that higher rates of veterans' family-marital life changes during the two-year premorbid period would be associated with reports of lower marital adjustment from both the hospitalized and control groups. As mentioned in Chapter II, family-marital life change and marital adjustment as measured by the SMAT were seen as essentially discrete variables within the broader context of marital and family functioning. Hypothesis 7 sought to determine the extent to which these two areas of functioning were interrelated among hospitalized participants. It was found that these areas were indeed related and to a significant extent. However, the same

correlation undertaken with control group data showed no significant relationship between veterans' marital adjustment and family-marital life change. Hence a high incidence of family-marital life change was associated with generally lower levels of marital adjustment among the chronically ill, whereas comparable rates of change among the healthy participants were unrelated to marital adjustment.

Although previous illness data, as measured by health history totals, were not designated as an illness variable prior to the study, the relationship between these totals and both family-marital life change and marital adjustment are worthy of mention at this point. Within the hospitalized group, for example, the magnitude of veterans' family-marital life change was found to be significantly related to Health History Inventory totals; however, the same relationship among control group participants was nonsignificant (see Table 15).^{*} Veterans' reports of marital adjustment levels were not related to the incidence of prior illness in either group (see Table 15).

These results coupled with results of the experimental hypotheses suggest the following picture of family-marital functioning as related to the chronic illness process: Of the two variables employed to measure family-marital functioning, the incidence of family-marital life change

*An admitted difficulty exists with this type of retrospective analysis. The family-marital category scores employed in the present study were obtained by summing all life change events within this category over the entire two-

among veterans was found to be significantly related to both the immediacy of subsequent illness onset and the incidence of previous illnesses. Despite nonsignificant relationships between marital adjustment and illness parameters, hospitalized group members reported significantly lower levels of marital adjustment. Also, family-marital life change magnitudes were found to be substantially higher in relation to controls. These two variables were significantly interrelated in the hospitalized group, whereas no significant relationship was found between these variables among control group participants. These findings do not support much in the way of speculation as to what, if any role veterans' marital adjustment played in relation to various illness variables. (Correlation coefficients were derived through the point-biserial correlation procedure). On the other hand, the incidence of family-marital life change emerged as a significant correlate vis-à-vis the illness process.

Relationship Between Other Life Change Variables and Illness

Although the results outlined above concerning the characteristics of family-marital functioning proved somewhat

year period prior to study; however, the Health History Inventory extends to five years prior to the study, measuring the number of different illnesses without regard to frequency, duration, or date of onset. Therefore, the correlation between family-marital life change and health history must presuppose a constant life change rate within both samples for the entire five-year period. Because of the time limitation built into the SRE, this premise cannot be tested, and hence conclusions based on these correlations must be regarded as tentative.

illuminating, the findings associated with veterans' personal-environmental life change appear to be most useful in terms of relating life change to illness onset. For example, among five correlations between each of the life change categories and illness severity (see Table 6), the incidence of veterans' personal-environmental change contributed the most statistically significant relationship. Also, when LCU scores within each of the three specific life change categories (family-marital, personal-environmental, and occupational-financial) were compared between the two groups (Table 8), the larger magnitude of change reported by hospitalized subjects in the personal-environmental category attained a closer proximity to statistical significance.

The direction of the relationship between veterans' personal-environmental change and the immediacy of illness onset was unexpected (see Table 10) in that higher rates of reported change within this category were associated with a more extended time span between the crisis period and the onset of illness. This finding ran counter to the supposition that higher rates of change within any of the categories would be followed by a more rapid onset of illness. One other relationship of note was found: between the incidence of personal-environmental change and the extent of previous illness (see Table 15). Personal-environmental change among the chronically ill was linked to illness histories, such that an individual reporting a wide diversity

of previous illness tended to report a correspondingly high rate of life change in this area of functioning. The same relationship among control group participants was not found to be significant. Moreover, the incidence of personal-environmental change among individuals in the hospitalized group was more highly related to illness history than reported change within the remaining four SRE life change categories (see Table 15).

To summarize, life change in the personal-environmental category has emerged as an important discriminating variable in that high rates of change in personal habits, residence, school, and living conditions during the two-year period prior to study appeared to characterize the chronically ill members of the study relative to control group counterparts, a difference which closely approached statistical significance. Furthermore, change of this nature among hospitalized subjects was significantly related to severity of the ongoing illness and retrospectively related to the onset of previous illnesses of other types. In contrast, healthy individuals were characterized by relatively low rates of personal-environmental change, and to the extent that such change did occur within this group, it was not retrospectively related to previous illness onset.

The Role of Occupational-Financial Life Change

Occupational-financial life change among veterans in

the study was not found to be of particular importance insofar as other variables in the study are concerned. In addition to not being related to severity of illness (see Table 6), change for veterans in the occupational-financial sphere was unique among the three specific life change categories in being nonsignificantly related to the incidence of previous illness (see Table 15). Furthermore, the incidence of change within this category among hospitalized participants was not significantly greater than that among healthy subjects (see Table 8). This finding contrasts with the reported incidence of change within the other four categories, each of which either attained or approximated statistical significance in between-group comparisons. The one exception to the general pattern of occupational-financial non-significance was in its relationship with immediacy of illness onset, in which higher rates of life change were associated with more rapid onset of illness following the crisis period (see Table 10). Hence, for the most part, veterans' reports of changes in job status or financial indebtedness were of limited assistance in furthering our understanding of the life change/illness process. This observation should be tempered by recognizing the substantial unemployment rates prevalent in both groups. Most financial changes and all job status changes are contingent upon employment of some type. Due to the fact that 47% of the chronically ill subjects and 36% of the healthy subjects were unemployed,

it appears that the incidence of occupational-financial life change among veterans in the study was not adequately measured.

Combined Total Versus Event Total Scoring Methods

The extremely high correlation between combined total-and event total scores in both samples (.99 in the hospitalized group, .97 in the control group) suggests that the two scoring systems were not substantially different. An examination of Tables 6, 8, 12, and 15, however, suggests that this was not necessarily the case. For example, combined total life change was significantly related to veterans' illness severity, whereas event total scores were not (see Table 6). The same contrast in scoring methods was found in relation to illness history among hospitalized participants: Higher combined total life change rates were associated with a greater diversity of previous illness, whereas event total rates were not (see Table 15).

In some instances, both measures of total life change were significantly related to the same variable, as in the case with SMAT conventionality scores among chronically ill members of the study (see Table 12). These results suggest that the higher the magnitude of total reported life change as determined by either scoring system, the more conventional the responses on the SMAT tended to be. A concluding observation shows total life change rates derived by both

scoring methods to be significantly higher among the chronically ill than among the healthy members of the study (see Table 8).

The primary difference in the two scoring methods was reflected in the respective relationships with illness parameters employed in the study (namely, HHI totals and SIRS values). In this regard, combined total scores were significantly related to each of these aspects of illness, whereas event total scores were unrelated to them. Hence it appears that the combined total method of computing the overall incidence of life change was the more sensitive of the two methods insofar as its relationship to illness measures is concerned.

Other Findings of Interest

A number of assorted, albeit noteworthy, findings emerged from data analyses which were apart from the mainstream of the present inquiry, yet contributed to a more comprehensive understanding of the phenomena under study. Of particular interest were the relationships between age and other variables of interest and the outcomes of comparisons among various illness parameters in the study. However, the results arising from a post hoc correlation between SRE/SMAT scores and hospital admission were probably the most helpful in terms of providing further information regarding the interrelatedness between (1) perceived family-

marital functioning and illness and (2) reported life change rates and illness. Therefore, the discussion will begin with the relationships of life change and marital adjustment measures to hospitalization.

Experimental Variables and Hospitalization

As noted above, no support was found for the contention that the marital adjustment component of family-marital functioning was related to various aspects of illness. Yet the differences in perceived marital adjustment levels and in the incidence of reported family-marital life change were found to be substantially different between the hospitalized and control groups, strongly suggesting that these two variables were related to some aspect of hospitalization. Therefore, correlation computations were undertaken on a post hoc basis between scores associated with the two components of family-marital functioning and the dichotomy of hospitalization/nonhospitalization.* In many respects, admission to the hospital could be considered the most relevant of the illness variables. Indeed, each of the three illness parameters presently employed (illness severity, immediacy of onset, and health history) was subject to distortion, confabulation, or procedural error of some type, whereas the

*Severity and immediacy of illness do not exhaust the list of possible illness parameters. Other objectifications of illness might include the duration of illness and time required for adequate recovery or symptom remission following discharge from the hospital.

reality of hospitalization/nonhospitalization transcends the issue of experimental error altogether.

The post hoc correlation coefficients showed that both reported family-marital life change and perceived marital adjustment were significantly related to hospitalization/non-hospitalization (see Table 16). It was thus determined that higher rates of family-marital life change among veterans and correspondingly lower levels of perceived marital adjustment were both frequently associated with hospitalization, whereas reports of lower rates of change and higher levels of adjustment were more often found among nonhospitalized individuals.

Based on the strength of this analysis, the conclusion that family-marital functioning is related to hospitalization, and therefore to the incidence of chronic illness itself, may be considered more viable. This finding constitutes the conceptual essence which underlies the first six hypotheses, each of which postulated a particular aspect of the relationships of family-marital functioning to chronic illness. As noted earlier, the specific manner in which family-marital functioning related to various aspects of the illness experience remains incompletely defined. It is apparent from the results of both the experimental hypotheses and the health history correlations that marital adjustment as perceived by veterans in the study was essentially unrelated to any of the three aspects of illness herein

employed. The incidence of family-marital life change, on the other hand, was related to both the incidence of previous illness among subjects and the immediacy with which illness onset occurred following the life change crisis period. Hence it appears that the individual's history of change within the family-marital area constitutes the more important of the two family-marital variables in terms of relatedness to subsequent chronic illness episodes. Based upon this presumption, future research in the area of family-marital functioning as related to illness will be potentially more enlightening if approached from the perspective of life change.

Beyond findings pertaining to family-marital functioning and hospitalization, post hoc correlations revealed that subjects' reported life change rates within the personal-environmental area were more highly related to hospitalization/nonhospitalization than were the remaining four life change categories (see Table 16). Hence, an individual undergoing high rates of change in personal habits, residence, school, and living conditions was more likely to be subsequently hospitalized and, by implication, to experience chronic illness. Conversely, individuals experiencing a low incidence of change in this area were equally likely to avoid chronic illness. This finding underscores the conclusion offered above that the incidence of premorbid personal-environmental life change was the single most important

factor in terms of wide-ranging relationships with illness.

Age

Surprisingly, no significant relationship existed between age and severity of illness ($r = .077$) among hospitalized group members. Although no formal statement to this effect was made prior to the study, it was expected that the more serious illnesses would be confined primarily to the older age group. The data suggest otherwise, however, in that patients in the present study who contracted chronic illness of a more serious nature tended to do so without regard to age. While not related to illness severity, the age factor among veterans in both groups was found to be significantly associated with health history totals (see Table 17). This finding reflected a wider diversity of illness occurring at an increased frequency among older members of both samples. These results parallel the general medical view that increased age is quite often accompanied by diseases and conditions which arise out of progressive physical vitiation.

Hospitalized subjects' age was found to be related to both perceived marital adjustment and the extent to which perceptions were overly conventionalized (see Table 13). Veterans attaining higher scores on the conventionality scale of the SMAT demonstrated a relatively greater concern for appearance and therefore an increased tendency toward

socially approved responses on the marital adjustment items of the SMAT. The opposite was not necessarily true. Individuals with lower conventionality scores seemed more likely to assess wives and marital relationships in a more realistic fashion. In the population studied, these individuals often reported relatively low marital adjustment levels.*

It was felt that the higher conventionality scores among older hospitalized members in the sample were related to age and that the increased tendency toward overly conventionalized responses resulted in an artificial elevation of marital adjustment scores among older veterans. The rationale underlying this proposition will be presented in more expanded form in the concluding section of this chapter. The same relationship between age and perceived marital adjustment was observed in the control group (see Table 13), but it did not attain statistically significant proportions. Moreover, no trend toward increased conventionality in relation to age was found among control members.

The significant negative correlations between age and reported life change rates within four of the five SRE categories among healthy participants in the study constituted

*The premise underlying the development of the conventionality scale was that while high conventionality scores are likely to be associated with artificially high marital adjustment scores, low conventionality scores indicate only that a realistic appraisal of the marital relationship has been rendered. The high positive correlation between SMAT scores and corresponding conventionality scores in the present study suggests that participants rendered a realistic appraisal only when marital relationships had deteriorated to a point where little justification could be made for expending energy in the interests of pretense and denial.

a very interesting finding, especially in light of the fact that no such relationship was found among hospitalized subjects in any of the five categories (see Table 17). Hence, among relatively healthy members of the study, a marked trend toward lower incidence of life change in all but the family-marital area of functioning accompanied increasing age. This finding suggests the attainment of an increasingly stabilized life style as a function of increased age among healthy individuals. In contrast, those afflicted with chronic illness were seeming unable to maintain this type of life style stability in any consistent fashion.

Interrelationships Among Illness Variables

One final set of findings merits further discussion: the relationships among the three illness variables employed in the study (see Table 18). The most pertinent of the three relationships was found in the correlation between severity of illness and immediacy of illness onset, the two major illness parameters. A virtual lack of correlation between these two variables strongly suggests that they encompassed two dissimilar aspects of illness. The independent occurrence of each variable in relation to the other tends to strengthen conclusions arising from the respective relationships with the remaining variables in the study.

The relationship between severity of illness and health history totals was also found to be statistically

nonsignificant, suggesting that the incidence of different illnesses prior to the study was unrelated to the severity of the illness for which each member of the hospitalized group was admitted. Again, the correlations between each of these variables and other variables in the study may be considered to be independent events, thereby permitting more conclusive statements as to the nature of these relationships. The correlation between immediacy of illness onset and health history totals approached but did not attain statistical significance. Hence, a trend toward nonassociation between higher incidence of previous illness and more rapid onset of the illness requiring hospitalization was observed.

Conclusions

A number of productive findings generated out of the present study serve both to confirm previous research findings and to enlarge upon these findings. The entire study was predicated on the premise that specific types of environmental inclemencies produce a physiological stress reaction on the part of the individual involved, eventually resulting in altered physiological functioning and in some cases physical illness. The study focused upon relatively common life change events which lead to greater or lesser amounts of stress (social readjustment) followed in time by the onset or recurrence of chronic illness symptoms.

Perhaps the most noteworthy finding in the investigation is that different areas of life change were differentially related to illness in the population studied. The basic contention of the study has been that, among chronically ill subjects, change within the context of family and marital functioning will be more highly related to illness measures in relation to change within other areas of living. While this contention was found to be basically untrue, the importance of alterations in a given individual's marital status quo was amply demonstrated insofar as subsequent chronic illness onset is concerned. The most pervasive and dominant area of life change in relation to illness was personal-environmental in nature. That is, changes in environmental conditions or personal living habits among chronically ill participants were consistently and strongly related to the severity of illness, previous illness history, and admission to the hospital.

The absence of association between marital adjustment and various measures of illness was unexpected, especially in light of the fact that adjustment levels were significantly lower among hospitalized participants than among healthy counterparts. Coupled with the fact that marital adjustment was significantly related to hospitalization itself, these findings suggest that socioemotional factors within marriage exert a substantial but nonspecific influence upon physiological functioning.

Regarding the question of marital adjustment measures, it may be recalled that a pronounced tendency to respond in a more conventional manner to marital adjustment items was observed in both groups, suggesting that a number of higher marital adjustment scores within the two groups were artificially elevated, especially among older hospitalized members. The problem of obtaining a realistic appraisal of marital adjustment is not by any means unique to the present study. The quest for an accurate, unbiased procedure for measuring marital integration is at least 40 years old. The tendency to distort SMAT responses in a more positive direction seems to reflect the internal needs of many participants in the study, again, particularly among older hospitalized members. Among the chronically ill, limited personal resources and unavoidable dependency needs arising from physical condition undoubtedly militate toward overlooking the less satisfactory aspects of marital relationships; in the writer's opinion, not a particularly healthy process in any marital relationship. While an individual faced with a certain degree of ongoing marital discord may perceive that he has no viable options beyond persevering, whatever feelings of resentment, frustration, etc., that he experiences will probably find an outlet in the relationship. Among the illness-prone, this outlet may often take the form of further somatic deterioration, perhaps leading to further dependency and a consequent need for increased denial.

Although little in the way of objective evidence was uncovered in this study to document the relationship between marital adjustment and illness, marital adjustment cannot be altogether ruled out as a factor in the etiology of illness. It may well be that a study which focuses upon the *processes* which characterize healthy or premorbid family and marital functioning would yield more productive results.

Age was found to be an important factor in differentiating between chronically ill and healthy participants. Certainly one of the most revealing findings is that among healthy individuals the magnitude of life change decreased as age increased. This pattern of life change stabilization was not found among the chronically ill, thereby reopening the question of illness etiology. The onset of a chronic, relatively debilitating illness constitutes one of the most potentially disruptive life events which can occur for any individual. In the population studied, many of the life changes reported by hospitalized subjects may well have been the result of poor health rather than the cause. Returning to the findings of Rahe and Arthur (1968), relatively equal amounts of life change were found to precede, as well as to follow, an illness episode. The lack of significant relationships reported by Wyler et al. (1971) between life change and acute illness episodes may be attributed to the fact that recurring chronic illness operates to perpetuate disruption in living conditions, which may then lead to

further exacerbation of illness. Because of the nonrecurring nature of acute illness, this demoralizing downward spiral of disrupted living conditions and deteriorating health is averted. The marked disruption of personal and environmental living conditions among the chronically ill, for example, may reflect, as well as effect, the recurrence of illness.

The current investigation was not designed to measure definitively the apparent interaction between life change and chronic illness. Indeed, any study which undertakes a one-time measurement of the variables is similarly limited. A more appropriate approach to exploring the life change/illness interaction would be to conduct a longitudinal inquiry. A periodic reassessment of life change events and health status over a period of several years would be useful in clarifying the relative contribution of each of these two factors in relation to the other. Also, collection of data at more frequent intervals would substantially improve the reliability of the ensuing data. Ideally, such a study would incorporate a much broader range of possible life change events and a more detailed illness format. Only through repeated measures of functioning for a given individual over time can the enigma of the life change/illness process be resolved.

APPENDICES

APPENDIX I

RECENT LIFE CHANGES QUESTIONNAIRE

Instructions for Marking Your Recent Life Changes

To answer the questions below, mark an X in one or more of the boxes to the right of each question. If the event in question has occurred to you within the past two years, indicate when it occurred by marking the appropriate box: 0-6 months ago, 7-12 months ago, 13-18 months ago, or 19-24 months ago. It may be the case with some of the events below that you experienced them over more than one of the time periods listed for the past two years. If so, marked all the appropriate boxes. If the event has not occurred to you during the past two years, leave all the boxes empty.

<u>Health</u>	0-6 Mo. Ago	7-12 Mo. Ago	13-18 Mo. Ago	19-24 Mo. Ago
Within the time periods listed, have you experienced:				
1. An illness which kept you in bed a week or more, or took you to the hospital?	—	—	—	—
2. An accident (automobile, motorcycle, etc.)?	—	—	—	—
3. Major dental work?	—	—	—	—
4. A substantial change in eating habits?	—	—	—	—
5. A substantial change in sleeping habits?	—	—	—	—
6. A change in your usual level of physical activity (at work as well as during leisure time)?	—	—	—	—

Work

Within the time periods listed, have you:

7. Changed to a new type of work? _____

8. Changed your work hours? _____

Work

Within the time periods listed, have you:	0-6 Mo. Ago	7-12 Mo. Ago	13-18 Mo. Ago	19-24 Mo. Ago
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9. Had a change in your responsibilities at work?

A. More responsibilities? _____

B. Less responsibilities? _____

10. Experienced a major change in your job?

A. Promotion? _____

B. Demotion? _____

C. Transfer? _____

11. Experienced a major reorganization of your business? _____

12. Experienced troubles at work?

A. With your boss? _____

B. With co-workers? _____

C. With persons under your supervision? _____

D. Other work troubles? _____

13. Experienced major success (including awards at work)? _____

14. Been fired (or laid off) work? _____

15. Taken correspondence courses to help you advance in your work? _____

16. Retired? _____

Home and Family

Within the time periods listed, have you experienced:

17. A residential move?

A. Within the same town or city? _____

B. Between different towns, cities, states, or countries? _____

Home and Family

Within the time periods listed, have you experienced:

0-6 Mo. Ago	7-12 Mo. Ago	13-18 Mo. Ago	19-24 Mo. Ago
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18. A change in the status of your parents?
 A. Divorce? _____
 B. Remarriage of mother or father? _____
 C. Death of mother or father? _____

19. A change in family "get-togethers"? _____

20. Death of brother or sister? _____

21. Concern over the health or behavior of a family member (major illnesses, accidents, drug addiction, disciplinary problems, etc.)? _____

22. Major change in your living conditions (home improvements or a decline in your home or neighborhood)? _____

23. Recent difficulties with your wife?
 A. Sexual difficulties? _____
 B. In-law problems? _____
 C. Other kinds of arguments? _____

24. Marital separation?
 A. Due to work? _____
 B. Due to marital problems? _____

25. Marital reconciliation? _____

26. Divorce? _____

27. Gain of a new family member?
 A. Birth of a child? _____
 B. Adoption of a child? _____
 C. A relative moving in with you? _____

Home and Family

Within the time periods listed, have you experienced:

	0-6 Mo. Ago	7-12 Mo. Ago	13-18 Mo. Ago	19-24 Mo. Ago
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28. Wife beginning or ceasing work outside the home? _____

29. Recent pregnancy? _____

30. Recent miscarriage or abortion? _____

31. Loss of child by death? _____

32. Loss of wife by death? _____

33. Child moving out of the home? _____

34. Marriage of a son or daughter? _____

35. Birth of a grandchild? _____

Personal and Social

Within the time periods listed, have you experienced:

36. A change in your personal habits (dress, friends, life style, etc.)? _____

37. An engagement to marry? _____

38. A marriage? _____

39. Girlfriend problems?

- A. Sexual difficulties? _____
- B. Unwanted pregnancy? _____
- C. Health problems? _____

40. Graduation from high school or college? _____

41. A recent vacation? _____

42. A recent change in your religious beliefs? _____

43. A recent change in your political beliefs? _____

Personal and Social

Within the time periods listed, have you experienced:	0-6 Mo. Ago	7-12 Mo. Ago	13-18 Mo. Ago	19-24 Mo. Ago
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44. A recent change in your social (group) relationships? _____

45. Lost a close friend by death? _____

46. Minor violations of the law? _____

47. Legal troubles leading you to be held in jail for a while? _____

48. A new, close personal relationship? _____

49. A "falling out" of a close personal relationship? _____

50. Major decision regarding your immediate future (college choice, military service, when you will retire, etc.)? _____

Financial

Within the time periods listed, have you:

51. Taken on a purchase more than \$100 but less than \$10,000 (TV, car, freezer, etc.)? _____

52. Taken on a purchase (mortgage) for more than \$10,000 (a home business, property, etc.)? _____

53. Experienced a foreclosure on a mortgage or loan? _____

54. Experienced financial difficulties? _____

APPENDIX II

LIFE CHANGE EVENT CATEGORIES AND LCU VALUES
DEVELOPED BY RAHE (1972)

Nomenclature and item-listing revisions for the present study are placed in parentheses () .

<u>Family (Family-Marital)</u>	LCU Values
Death of spouse	100
Divorce	73
Marital separation	65
Death of close family member	63
Marriage	50
Marital reconciliation	45
Major change in health of family member	44
Pregnancy	40
Addition of new family member	39
Major change in arguments with wife	35
Son or daughter leaving home	29
In-law troubles	29
Wife starting or ending work	26
Major change in family get-togethers	15
(Sexual difficulties)*	39
<u>Personal (Personal-Environmental)</u>	
Detention in jail	63
Major personal injury or illness	53
Death of a close friend	37
Outstanding personal achievement	28
Start or end of formal schooling	26
Major change in living conditions	25
Major revision of personal habits	24
Changing to a new school	20
Change in residence	20
Major change in recreation	19
Major change in church activities	19
Major change in sleeping habits	16
Major change in eating habits	15
Vacation	13
Christmas	12
Minor violations of the law	11
<u>Work (Occupational-Financial)</u>	
Being fired from work	47
Retirement from work	45
Major business adjustment	39

	LCU Values
<u>Work (Occupational-Financial)</u>	
Changing to different line of work	36
Major change in work responsibilities	29
Trouble with boss	23
Major change in working conditions	20
<u>Financial (Occupational-Financial)</u>	
Major change in financial state	38
Mortgage or loan over \$10,000	31
Mortgage foreclosure	30
Mortgage or loan less than \$10,000	17

*Shifted from Rahe's personal category.

APPENDIX III
MARRIAGE QUESTIONNAIRE

(Please read carefully)

Check the dot on the scale line below which best describes the degree of happiness, everything considered, of your present marriage. The middle point, *happy*, represents the degree of happiness which most people get from marriage, and the scale gradually ranges, on one side, to those few who are very unhappy in marriage and, on the other side, to those who experience extreme joy or happiness in marriage.

1. Very unhappy Happy Perfectly happy

On the following items, state the approximate extent of agreement or disagreement between you and your wife. Please place a *check* in the appropriate column for your response.

	Always Agree	Always Agree	Occasion- ally	Frequent- ly	Always Disagree	Always Disagree
2. Handling family finances						
3. Matters of recreation						
4. Demonstrations of affection						
5. Sex relations						
6. Friends						
7. Conventionality (right, good, or proper conduct)						
8. Philosophy of life						
9. Ways of dealing with in-laws						

10. There are times when my wife does things that make me unhappy.

True _____ False _____

11. My marriage is not a perfect success.

True _____ False _____

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VA Form 10-51(573)

APPENDIX IV
SERIOUSNESS OF ILLNESS RATING SCALE

Rank Order and Geometric Mean Scores of Disease Items

Rank	Disease Item	Mean Severity Rating
1.	Dandruff	21
2.	Warts	32
3.	Cold sore, canker sore	43
4.	Corns	46
5.	Hiccups	48
6.	Bad breath	49
7.	Sty	59
8.	Common cold	62
9.	Farsightedness	72
10.	Nosebleed	73
11.	Sore throat	74
12.	Nearsightedness	75
13.	Sunburn	80
14.	Constipation	81
15.	Astigmatism	83
16.	Laryngitis	84
17.	Ringworm	85
18.	Headache	88
19.	Scabies	89
20.	Boils	96
21.	Heartburn	98
22.	Acne	103
23.	Abscessed tooth	108
24.	Colorblindness	109
25.	Tonsillitis	117
26.	Diarrhea	118
27.	Carbuncle	122
28.	Chicken pox	134
29.	Menopause	140
30.	Mumps	148
31.	Dizziness	149
32.	Sinus infection	150
33.	Bed sores	153
34.	Increased menstrual flow	154
35.	Fainting	155
36.	Measles	159
37.	Painful menstruation	163
38.	Infection of the middle ear	164
39.	Varicose veins	173
40.	Psoriasis	174
41.	No menstrual period	175
42.	Hemorrhoids	177

Rank	Disease Item	Mean Severity Rating
43.	Hay fever	185
44.	Low blood pressure	189
45.	Eczema	204
46.	Drug allergy	206
47.	Bronchitis	210
48.	Hyperventilation	211
49.	Shingles	212
50.	Mononucleosis	216
51.	Infected eye	220
52.	Bursitis	222
53.	Whooping cough	230
54.	Lumbago	231
55.	Fibroids of the uterus	234
56.	Migraine	242
57.	Hernia	244
58.	Frostbite	263
59.	Goiter	283
60.	Abortion	284
61.	Ovarian cyst	288
62.	Heatstroke	293
63.	Gonorrhea	296
64.	Irregular heartbeat	302
65.	Overweight	309
66.	Anemia	312
67.	Anxiety reaction	315
68.	Gout	322
69.	Snake bite	324
70.	Appendicitis	337
71.	Pneumonia	338
72.	Depression	344
73.	Frigidity	347
74.	Burns	348
75.	Kidney infection	374
76.	Inability for sexual intercourse	382
77.	Hyperthyroid	393
78.	Asthma	413
79.	Glaucoma	426
80.	Sexual deviation	
81.	Gallstones	454
82.	Arthritis	468
83.	Starvation	473
84.	Syphilis	474
85.	Accidental poisoning	480
86.	Slipped disk	487
87.	Hepatitis	488
88.	Kidney stones	499
89.	Peptic ulcer	500
90.	Pancreatitis	514

Rank	Disease Item	Mean Severity Rating
91.	High blood pressure	520
92.	Smallpox	530
93.	Deafness	533
94.	Collapsed lung	536
95.	Shark bite	545
96.	Epilepsy	582
97.	Chest pain	609
98.	Nervous breakdown	610
99.	Diabetes	621
100.	Blood clot in blood vessels	631
101.	Hardening of the arteries	635
102.	Emphysema	636
103.	Tuberculosis	645
104.	Alcoholism	688
105.	Drug addiction	722
106.	Coma	725
107.	Cirrhosis of the liver	733
108.	Parkinson's disease	734
109.	Blindness	737
110.	Mental retardation	745
111.	Blood clot in the lung	753
112.	Manic depressive psychosis	766
113.	Stroke	774
114.	Schizophrenia	776
115.	Muscular dystrophy	785
116.	Congenital heart defect	794
117.	Tumor in the spinal cord	800
118.	Cerebral palsy	805
119.	Heart failure	824
120.	Heart attack	855
121.	Brain infection	872
122.	Multiple sclerosis	875
123.	Bleeding in the brain	913
124.	Uremia	963
125.	Cancer	1020
126.	Leukemia	1080

APPENDIX V
HEALTH HISTORY QUESTIONNAIRE

Please place a *check* beside all of the following illnesses you have had during the past five years:

<input type="checkbox"/> Laryngitis	<input type="checkbox"/> Arthritis
<input type="checkbox"/> Scabies	<input type="checkbox"/> Slipped disk
<input type="checkbox"/> Tonsillitis	<input type="checkbox"/> Hepatitis
<input type="checkbox"/> Chicken pox	<input type="checkbox"/> Kidney stones
<input type="checkbox"/> Mumps	<input type="checkbox"/> Peptic ulcer
<input type="checkbox"/> Sinus infection	<input type="checkbox"/> Pancreatitis
<input type="checkbox"/> Fainting	<input type="checkbox"/> High blood pressure
<input type="checkbox"/> Measles	<input type="checkbox"/> Smallpox
<input type="checkbox"/> Infection of the middle ear	<input type="checkbox"/> Collapsed lung
<input type="checkbox"/> Varicose veins	<input type="checkbox"/> Chest pain
<input type="checkbox"/> Psoriasis	<input type="checkbox"/> Diabetes
<input type="checkbox"/> Hemorrhoids	<input type="checkbox"/> Blood clot in blood vessels
<input type="checkbox"/> Hay fever	<input type="checkbox"/> Hardening of the arteries
<input type="checkbox"/> Low blood pressure	<input type="checkbox"/> Emphysema
<input type="checkbox"/> Eczema	<input type="checkbox"/> Tuberculosis
<input type="checkbox"/> Bronchitis	<input type="checkbox"/> Coma
<input type="checkbox"/> Shingles	<input type="checkbox"/> Cirrhosis of the liver
<input type="checkbox"/> Mononucleosis	<input type="checkbox"/> Parkinson's disease
<input type="checkbox"/> Bursitis	<input type="checkbox"/> Blood clot in the lung
<input type="checkbox"/> Lumbago	<input type="checkbox"/> Stroke
<input type="checkbox"/> Migraine	<input type="checkbox"/> Congenital heart defect
<input type="checkbox"/> Hernia	<input type="checkbox"/> Tumor in the spinal cord
<input type="checkbox"/> Goiter	<input type="checkbox"/> Muscular dystrophy
<input type="checkbox"/> Irregular heartbeat	<input type="checkbox"/> Cerebral palsy
<input type="checkbox"/> Anemia	<input type="checkbox"/> Heart failure
<input type="checkbox"/> Gout	<input type="checkbox"/> Heart attack
<input type="checkbox"/> Appendicitis	<input type="checkbox"/> Brain infection
<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Multiple sclerosis
<input type="checkbox"/> Kidney infection	<input type="checkbox"/> Bleeding in the brain
<input type="checkbox"/> Hyperthyroid	<input type="checkbox"/> Uremia
<input type="checkbox"/> Asthma	<input type="checkbox"/> Cancer
<input type="checkbox"/> Glaucoma	<input type="checkbox"/> Leukemia
<input type="checkbox"/> Gallstones	

APPENDIX VI
DEMOGRAPHIC QUESTIONNAIRE

Date
Researcher
Location

Patient Information

Primary admitting diagnosis

Primary discharge diagnosis

SIRS score

Date entered hospital

Length of hospitalization

Nonhospitalized Subject Information

Is the subject a military veteran? (Must answer yes).

Has the subject been hospitalized for any illness during the past five years? (Must answer no).

Is the subject eligible for hospitalization in the VA?

Does he believe he could become eligible should he require treatment?

Personal Information

Age

Highest educational level attained

Two-Year Marital History

Is the person married presently?

Has he lived continuously with his wife for the past two years?

If not: Has he been newly married within the past 12-24 months?

Date of current marriage or most recent marriage:

Has the subject been separated (for any reason) for more than 1 and less than 12 months during the past two years?

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BIOGRAPHICAL SKETCH

Howard Gray Atkins, Jr., was born in Detroit, Michigan, on November 18, 1945. He attended elementary and secondary schools in Oklahoma City, Oklahoma, graduating from Northwest Classen High School in May 1964. He attended Oklahoma State University from September, 1964, to June, 1968, receiving a Bachelor of Sciences degree in psychology. While at Oklahoma State University, he was named to the Dean's and President's Honor Rolls, Arts and Sciences Honor Society, and Phi Kappa Phi Honorary Society, and was a member of Beta Theta Pi social fraternity. He began graduate training in clinical psychology at the University of Florida in September, 1968. While at the University of Florida, he was selected for two Veterans Administration Traineeships, extending from September, 1970, to August, 1972. He received the Master of Arts degree in December, 1970, and the Doctor of Philosophy degree in August, 1975. He was commissioned as a Captain in the United States Army in September, 1970, and served an internship at Walter Reed Army Medical Center from September, 1972, to August, 1973. He is currently working as a staff clinical psychologist at the Mental Hygiene Consultation Service, U.S. Army Hospital, Fort Campbell, Kentucky. His wife is the former Sally Ann Swigert, and they have two children, Brett Alan and Scott Christopher.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



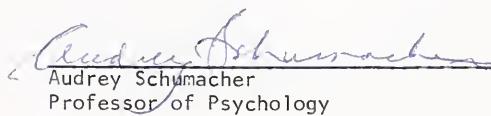
Ben Barger, Chairman
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



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Assistant Professor of Psychology

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Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Robert Ziller
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



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